Final
Environmental Assessment

Western Range
Command Transmit Site

Vandenberg Air Force Base
California

20 January 2005

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FINDING OF NO SIGNIFICANT IMPACT

Western Range Command Transmit Site

Vandenberg Air Force Base, California

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 U.S. Code 4321 *et seq.*, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP), the U.S. Air Force (Air Force) conducted an assessment of the potential environmental consequences of constructing a new Missile Flight Termination Ground System (MFTGS) dock facility that will serve as the Western Range (WR) Command Transmit (CT) site on Vandenberg Air Force Base (AFB), California.

Vandenberg AFB is headquarters to the 30th Space Wing, the Air Force Space Command unit that operates Vandenberg AFB and the Western Range. Vandenberg AFB operates as a missile test base and aerospace center, supporting west coast space launch activities for the Air Force, Department of Defense, National Aeronautics and Space Administration, and commercial contractors.

Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco. The 99,100-acre base extends along approximately 35 miles of the Santa Barbara County coastline.

The MFTGS is a Range Safety Critical System used to transmit radio carrier and frequency-modulated radio messages to launch vehicles that will cause the onboard receiver/decoders to activate flight termination functions in the event of an anomaly. MFTGS primary support facilities must meet line-of-site (LOS) requirements for active launch pads. Backup primary support is required whenever a primary site is taken out of commission to undergo improvements or repairs. MFTGS primary and backup support for Space Launch Complex (SLC) -3 and SLC-6 is presently not available. An MFTGS primary and backup support facility for these two launch complexes is needed in support of the Evolved Expendable Launch Vehicle (EELV) program.

The Environmental Assessment (EA) (incorporated as an attachment to this finding) considered all potential impacts of the proposed action and alternatives, both as a solitary action and potentially in conjunction with other similar projects. The EA summarizes the results of the evaluations of the proposed action and alternatives. It analyzes activities that have the potential to affect both the natural and human environment. This analysis summarizes the options evaluated and provides information explaining the need for the Proposed Action and its effect on human and natural resources.

PROPOSED ACTION

The Proposed Action is to construct and operate a docking facility for two command transmitters that would provide LOS coverage to all launch facilities within Vandenberg AFB. The site selected for the facility is a three-acre parcel located approximately 250 feet west of 13th Street and 1,740 feet south of Watt Road, on north Vandenberg AFB. The proposed facility would entail:

- Installation of concrete/asphalt foundation to accommodate the two command transmitters, omni-antennas, directional antennas, generator buildings, communications center and an office/maintenance building.
- Installation of two command transmitter units, four omni-antennas (100 feet high) and four directional antennas (31 feet high).

- Installation of two generators and fuel storage tanks within two mobile buildings.
- Installation of a portable unit to serve as office/maintenance building.
- Installation of a 1,000 gallon capacity underground septic system.
- Installation of a 250-foot access road connecting the facility to 13th Street.

The following utilities would be required:

- Installation of a 250-foot underground water pipeline, a 1,200-foot overhead electrical power line on existing power poles, and approximately 3,600 feet of parallel underground fiber optic communications lines.

Construction of the proposed facility would occur over a 10-month period. After completion of construction, an estimated one to two personnel would man the facility eight hours per day, five days per week, 52 weeks per year. During launches, an additional two to four personnel would be present at the facility for approximately eight hours. At the present time, approximately 18 launches per year are planned.

Implementation of the No-Action Alternative would preclude meeting LOS backup and primary-support requirements for EELV program launch facilities at Vandenberg AFB. A decision to not construct the new WR CT site could result in the EELV program missing critical program objectives.

Alternative C would incorporate the same components as those of the Proposed Action but the location of the site would be approximately 240 feet north of the Proposed Action. However, this proposed location would result in a longer fiber optic cable route and would be within the caution hazard corridor of future launches from a facility northeast of Watt Road.

All other sites considered for location of the proposed WR CT site that would meet LOS coverage for all launch complexes on Vandenberg AFB were eliminated from further analysis due to conflicts with explosive safety zones, launch hazard zones, radio frequency radiation hazards and airfield clearance requirements.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action and Alternative C presented in the EA concluded that no adverse effects should result to Cultural Resources (Section 4.2), Air Quality (Section 4.3), Water Resources (Section 4.4), Earth Resources (Section 4.5), Hazardous Materials and Waste Management (Section 4.6), Land Use and Aesthetics (Section 4.7), Utilities (Section 4.8), and Human Health and Safety (Section 4.9). All measures described in the EA (Section 2.1.9) will be implemented to ensure adverse impacts are precluded. No cumulative adverse impacts will result from activities associated with construction of the WR CT site, when considered in conjunction with recent past and future projects within the project area (Section 4.10).

Three areas of environmental consequences evaluated in the EA were determined to have the potential to result in minor impacts.

a) Biological Resources

Approximately three acres of low quality Central Coastal Scrub would be lost for construction of the facility. One federally and state endangered plant species, Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), and one federal plant species of special concern, Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*), were documented as occurring within the Area of Potential Effects. Specimens of Gaviota tarplant documented during pre-construction surveys will be isolated and

avoided during construction activities. Avoidance and protection measures as described in Section 2.1.9.1 would be implemented for Kellogg's horkelia. No significant impacts are anticipated (see EA Sections 3.1 and 4.1).

The project would result in minor adverse impacts to wildlife due to the permanent loss of low-value wildlife habitat as well as low quality habitat for special status avian species. Pre-construction surveys and monitoring as described in Section 2.1.9.1 would minimize any potential adverse impacts to wildlife species resulting from disturbances associated with construction activities and operation of the facility. No significant impacts are anticipated (see EA Sections 3.1 and 4.1).

b) Air Quality

Mobile source emissions would temporarily increase during construction, but would not exceed regulatory standards. No significant impacts are anticipated (see EA Sections 3.3 and 4.3). All measures described in the EA (Section 2.1.9.3) will be implemented to further decrease emissions during construction. During operations, the stand-by generators would comply with the Stationary Diesel Airborne Toxic Control Measure. In addition, new regulations and requirements as of January 1, 2005 for new diesel engines would be reviewed and an Air Pollution Control District Permit would be obtained if required prior to their installation. An Air Conformity Analysis completed under 40 CFR 93.153(b), (c), and section 176(c)(4) of the Clean Air Act, deemed the Proposed Action *de minimis* and exempt from further conformity requirements.

c) Water Quality

Because the project would disturb an area greater than one acre, a National Pollutant Discharge Elimination System (NPDES) permit would be required to protect water resources. The NPDES Permit requires the development and implementation of a Storm Water Pollution Prevention Plan that includes preventative maintenance measures for construction equipment, spill prevention and response measures, sediment and soil erosion control measures, and identifies measures for management of runoff.

d) Land Use and Aesthetics

The Air Force will coordinate the Proposed Action with the California Coastal Commission in compliance with the Coastal Zone Management Act.

FINDING OF NO SIGNIFICANT IMPACT

Based upon our review of the facts and analyses contained in the attached EA, conducted in accordance with the provisions of NEPA, the CEQ Regulations, AFI 32-7061, as amended by the interim change dated March 12, 2003, which adopted 32 CFR Part 989, we conclude that the Proposed Action should not have a significant environmental impact, either by itself or cumulatively with other ongoing projects at Vandenberg AFB. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact completes the Environmental Impact Analysis Process.

FINDING OF NO SIGNIFICANT IMPACT
CONCURRENCE PAGE

Environmental Assessment for the Western Range Command Transmit Site
Vandenberg Air Force Base, California

I concur with the Finding of No Significant Impact (FONSI)

Environmental Protection Committee Approval:

FRANK GALLEGOS, Colonel, USAF
Commander, 30th Space Wing
Chairman, Environmental Protection Committee
Vandenberg AFB, CA

22 Feb 05
Date

Judge Advocate Approval:

RAYMOND F. CHAMBERLAND, Lt Col, USAF
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Vandenberg AFB, CA

11 Feb 05
Date

Squadron Approval:

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Deputy Base Civil Engineer
Vandenberg AFB, CA

1 Feb 05
Date

Final
Environmental Assessment

Western Range Command Transmit Site

Vandenberg Air Force Base
California

Submitted To:

Department of the Air Force
30th Space Wing
Environmental Flight
Vandenberg Air Force Base, California

20 January 2005

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Acronyms and Abbreviations

%	Percent
°F	Degrees Fahrenheit
30 CES/CEVPN	30th Space Wing Civil Engineering Squadron, Environmental Flight, Natural Resources Section
30 SW	30th Space Wing
30 SCS	30th Space Wing Space Communication Squadron
AADT	Average annual daily trips
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AHPA	Archaeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
AOC	Area of Concern
AOI	Area of Interest
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
AST	Aboveground Storage Tank
AWG	American Wire Gauge
BMP	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CCA	California Coastal Act
CCR	California Code of Regulations
CCWA	Central Coast Water Authority
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon monoxide
CPIF	California Partners in Flight
CSC	California species of concern
CT	Command Transmit
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted decibels
DOD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EELV	Evolved Expendable Launch Vehicle
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency

EPCRA	Emergency Planning and Community Right-to-Know Act
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FE	Federally endangered
FP	Federally protected
FSC	Federal species of concern
ft	Feet
ft^2	Square feet
H_2S	Hydrogen sulfide
Hazmart	Hazardous Materials Pharmacy
HSWA	Hazardous and Solid Waste Amendments
HWMP	Hazardous Waste Management Plan
ICBM	Intercontinental Ballistic Missile
IRP	Installation Restoration Program
KVA	Kilovolts-Ampere
Kw	Kilowatts
L_{eq}	Average sound level
L_{eq1H}	One-hour average sound level
LOS	Line-of-sight
MBTA	Migratory Bird Treaty Act
MFTGS	Missile Flight Termination Ground System
mgd	Million gallons per day
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	Noise Control Act
NDPES	National Pollutant Discharge Elimination System
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_x	Nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
ODC	Ozone depleting chemical
OSHA	Occupational Health and Safety Act
P2	Pollution Prevention
Pa	Pascal
Pb	Lead
PGE	Pacific Gas and Electric Company
PM_{10}	Particulate matter 10 microns or less in diameter
$PM_{2.5}$	Particulate matter 2.5 microns or less in diameter
POL	Petroleum oil and lubricants
PPA	Pollution Prevention Act
ppm	Parts per million
PPMP	Pollution Prevention Management Act
RCRA	Resource Conservation and Recovery Act
RF	Radio frequency
RNV	Satellite and Launch Control Systems Program Office, Western Range
ROC	Reactive organic compound

RSOR	Range Safety Operations Requirement
RWQCB	Regional Water Quality Control Board
SBCAPCD	Santa Barbara County Air Pollution Control District
SE	State endangered
SEL	Sound exposure level
SLC	Space Launch Complex
SMC	Space and Missile Systems Center
SO_2	Sulfur dioxide
SO_4	Sulfate
SR	State Route
SW	Space Wing
SWPPP	Storm Water Pollution Prevention Plan
USAF	U.S. Air Force
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded ordnance
VOC	Volatile organic compound
VUS	Vehicle Uplink System
WR	Western Range
yd^3	Cubic yards
$\mu g/m^3$	micrograms per cubic meter

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Chapter 1. Purpose of and Need for the Proposed Action

The United States Air Force (Air Force or USAF) proposes to construct a new Missile Flight Termination Ground System (MFTGS) dock facility in 2005 that will serve as the Western Range (WR) Command Transmit (CT) site, on Vandenberg Air Force Base (AFB), California, in an undeveloped area west of 13th Street and south of Watt Road. This Environmental Assessment (EA) has been prepared to evaluate the potential environmental effects of implementing the Proposed Action and alternatives.

1.1 Project Location

Vandenberg AFB is headquarters for the 30th Space Wing (SW). The Air Force's primary missions at Vandenberg AFB are the launching and tracking of satellites into space polar earth orbit, training missile and space crews, testing and evaluating America's Intercontinental Ballistic Missile (ICBM) systems, and supporting aircraft tests in the Western Range (USAF 2004).

Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco (Figure 1-1). The Base covers 99,099 acres in western Santa Barbara County (USAF 2004) and occurs in a transitional ecological region that includes the northern and southern distributional limits for many plant and animal species.

The area identified as meeting the objectives and requirements of the WR CT Site is approximately 270 feet wide, located approximately 250 feet (76 meters) west of 13th Street and up to 1,980 feet (603 meters) south of Watt Road, and is depicted in Figure 1-2.

1.2 Purpose and Need

The MFTGS is a Range Safety Critical System used to transmit radio carrier and frequency-modulated radio messages to launch vehicles that will cause the onboard receiver/decoders to activate flight termination functions in the event of an anomaly. As defined in the September 2002 edition of the 30 SW Range Safety Operations Requirement (RSOR), MFTGS primary support facilities must meet line-of-sight (LOS) requirements for active launch pads. Backup and primary support is required whenever a primary site is taken out of commission to undergo engineering improvements, modifications or repairs. At the present time, a single site that provides LOS coverage for all launch facilities on Vandenberg AFB does not exist. During a space vehicle launch, several sites must be activated to provide LOS coverage.

An MFTGS dock facility is needed for both backup and primary support for Space Launch Complex (SLC)-3 and SLC-6 in support of the Evolved Expendable Launch Vehicle (EELV) program. At the present time, the only site that provides LOS coverage for SLC-3 (Atlas V) is CT-1, while CT-3 is the only site that provides LOS coverage for SLC-6 (Delta IV). Backup and primary support facilities for SLC-3 and SLC-6 are not available. Without this backup capability to support CT-1 or CT-3 LOS coverage requirements, launches would be delayed in the event of a required repair, replacement, modification or improvement of CT-1 and/or CT-3. In addition, CT-3 is within the hazard zone for southern orbital launches and must be evacuated during these launches.

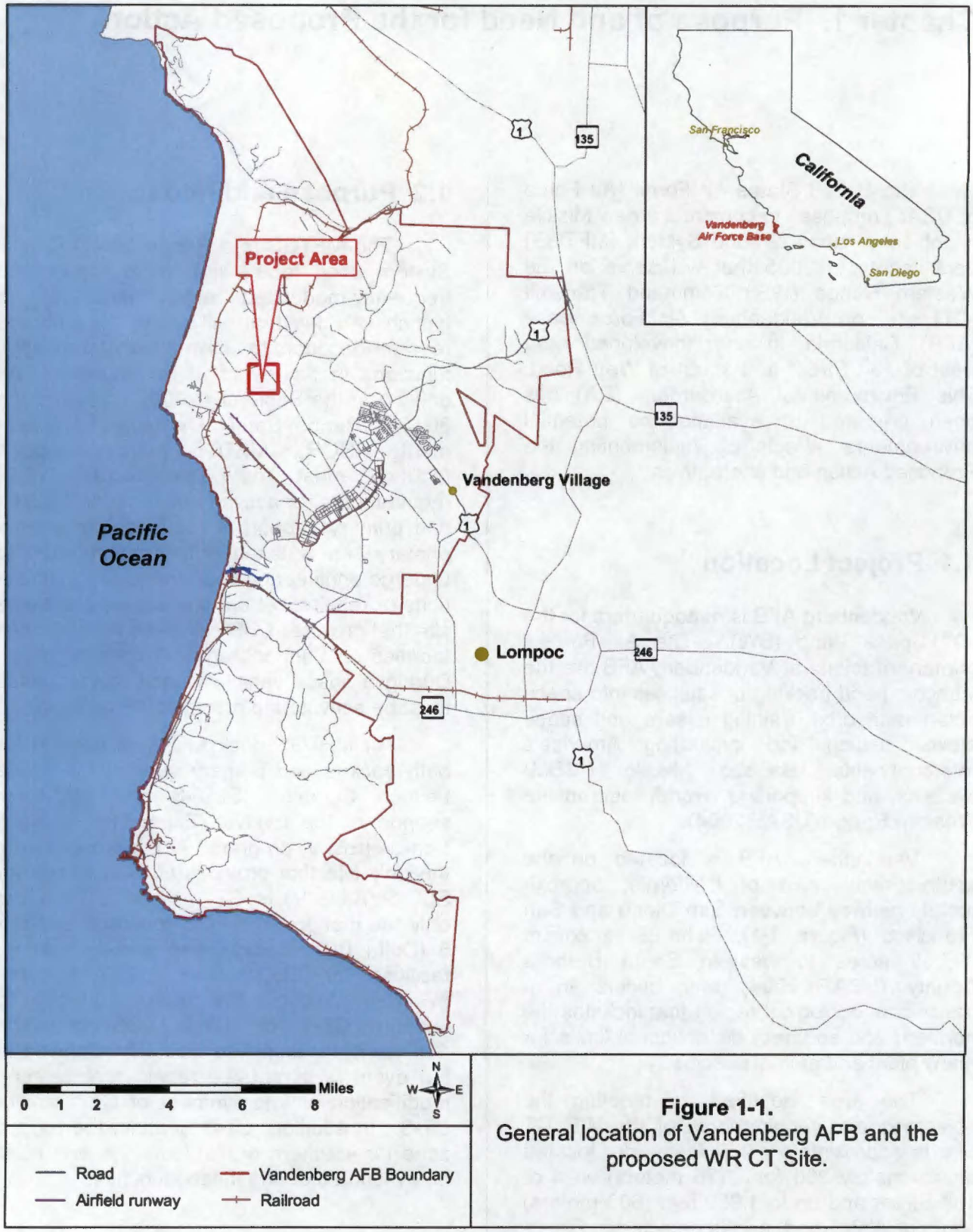

Figure 1-1.
General location of Vandenberg AFB and the proposed WR CT Site.

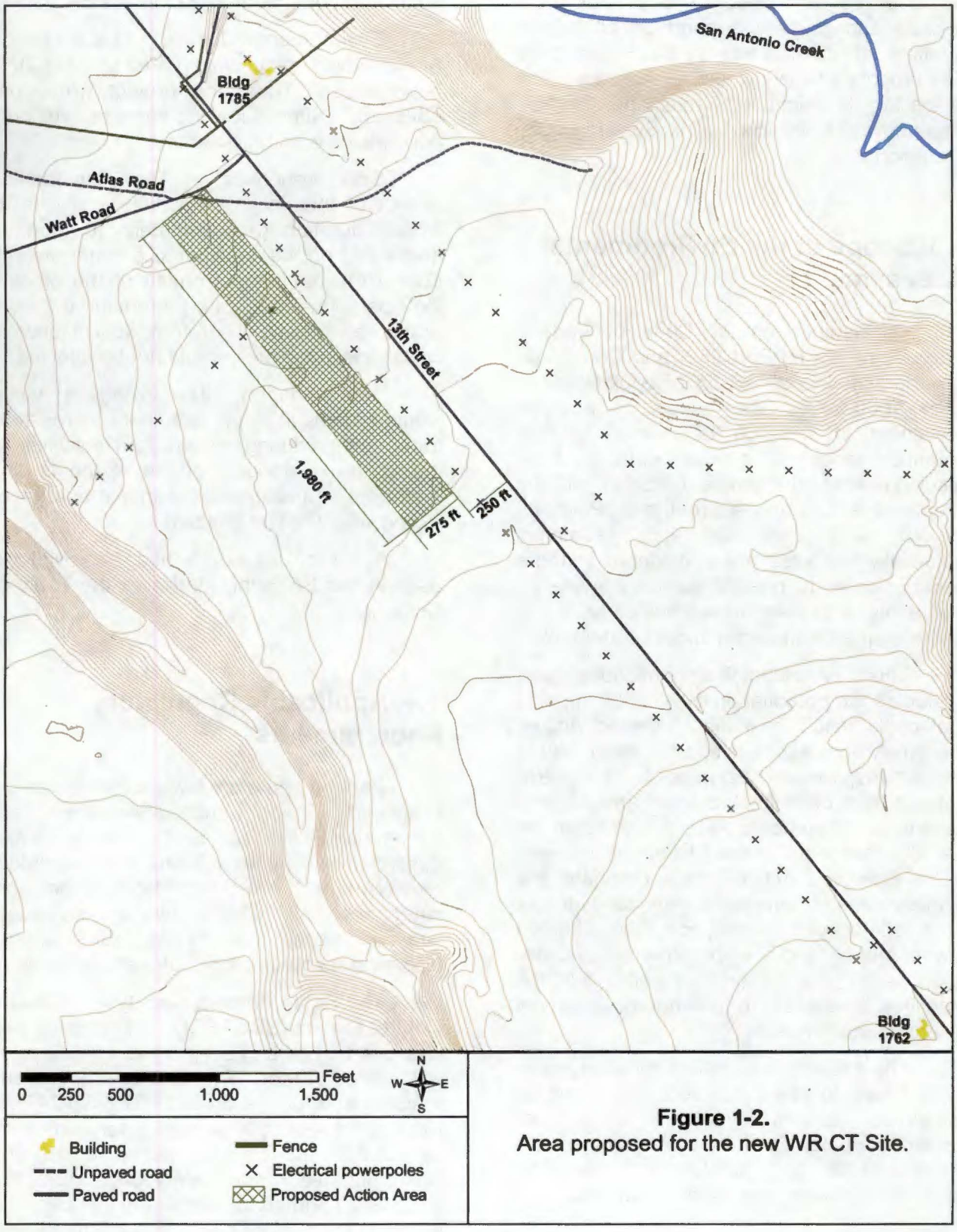

Figure 1-2.
Area proposed for the new WR CT Site.

Construction of a new WR CT Site would afford the capability to provide LOS backup and primary support to all launch facilities at Vandenberg AFB (Figure 1-3). The proposed facility would support operation of the Mobile Command Transmitter System, also known as Vehicle Uplink System (VUS) Transportable.

1.3 Scope of the Environmental Assessment

Consistent with 32 Code of Federal Regulations (CFR) Part 989, and Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508), the scope of analysis presented in this EA is defined by the potential range of environmental impacts resulting from the implementation of the Proposed Action and Alternatives. Pursuant to 40 CFR Part 1501.4(c), resources potentially impacted are considered in more detail in order to provide sufficient evidence and analysis to determine whether or not to prepare an environmental impact statement.

This EA identifies, describes and evaluates the potential environmental impacts that could result from the Proposed Action, the No-Action Alternative, and other viable alternatives, as well as possible cumulative impacts from other past, present and planned actions on Vandenberg AFB. In, addition, the EA identifies environmental permits relevant to the Proposed Action. As appropriate, the EA describes, in terms of a regional overview or a site-specific description, the affected environment and environmental consequences of the action. Finally, the EA identifies measures to prevent or minimize environmental impacts.

The resources identified for analysis in this EA include: biological resources; cultural resources; air quality; earth resources; hazardous materials and waste management; human health and safety; land use and aesthetics; utilities; and water resources.

The following resources were considered but not analyzed in this EA:

Environmental Justice. The Proposed Action would occur within Vandenberg AFB boundaries. Thus, the project would not adversely affect low-income or minority populations within the region.

Socioeconomics. The construction aspect of the Proposed Action would be of limited duration (approximately 10 months) and would not be considered a major project. During the operational phase of the project, DoD personnel would be performing the work at the new facility. Therefore, socioeconomic conditions in the area would not be affected.

Transportation. The Proposed Action would not result in an inordinate increase in traffic, either during construction activities or during the operational phase of the facility. Therefore, transportation within the area or region would not be affected.

A list of acronyms and abbreviations used in this EA is included after the Table of Contents.

1.4 Applicable Regulatory Requirements

Federal and state laws applicable to the Proposed Action and alternatives are summarized in Table 1-1 and further described in Chapters 3 and 4. Regulatory requirements are applicable for six categories: air quality, water resources, coastal resources, hazardous waste, biological resources, and cultural resources.

The Santa Barbara County Air Pollution Control District (SBCAPCD) is proposing rule changes that take effect in 2005. These rules will affect the air quality operations requirements of this project. The SBCAPCD rules are specifically designed for controlling air pollution and to protect public health. The California Health and Safety Code gives the SBCAPCD primary responsibility including the authority to develop, adopt, and enforce rules.

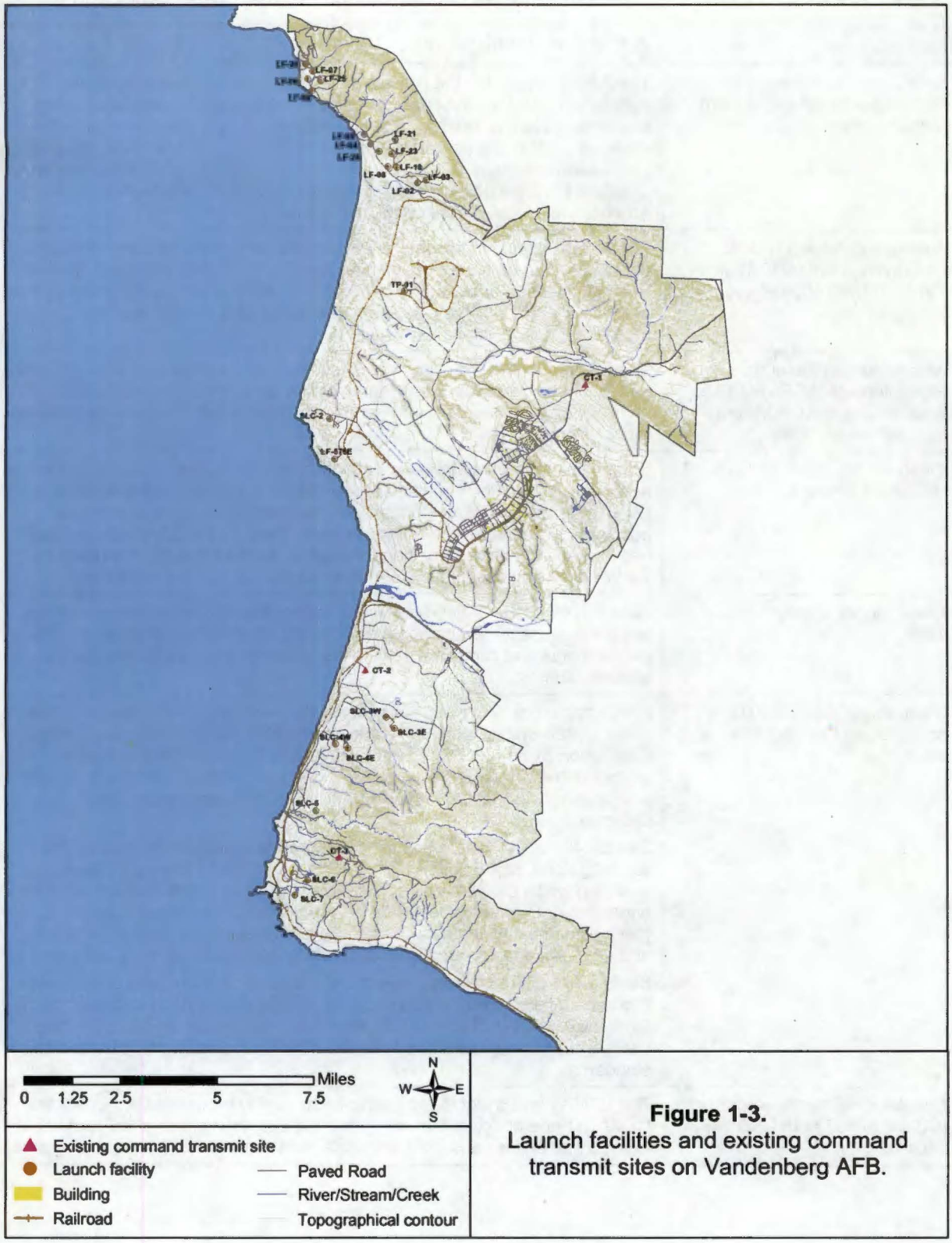

Figure 1-3.
Launch facilities and existing command transmit sites on Vandenberg AFB.

Table 1-1.
Federal and State laws applicable to the implementation of the Proposed Action.

Federal Law	Activity or Requirement
American Indian Religious Freedom Act (AIRFA) of 1978 (42 USC 1996)	The AIRFA states that the policies and procedures of Federal agencies must comply with the constitutional injunction prohibiting abridgment of religious freedom—including freedom of belief, expression, and exercise—for Native Americans. The statute ensures Native American access to sites, use and possession of sacred objects, and freedom to worship, and directs federal agencies to revise policies and procedures to correct conflicts with Native American religious cultural rights and practices.
Archaeological and Historic Preservation Act (AHPA) of 1974 (16 USC 469a et seq.)	The AHPA is directed toward the preservation of historic and archaeological data that would otherwise be lost as a result of federal construction or other federally licensed or assisted activities. The AHPA authorizes the Department of the Interior to undertake recovery, protection, and preservation of archaeological or historic data.
Archaeological Resources Protection Act (ARPA) of 1979 (USC 470aa-mm), Supplemental Regulations of 1984	The ARPA secures protection of archaeological resources and sites on public and Indian lands; requires permitting for any excavation or collection of archaeological material from these lands; provides civil and criminal penalties for violations.
Clean Air Act (CAA) of 1970 (42 USC 7401 et seq.)	States that applicable state and national ambient air quality standards must be maintained during the operation of any emission source. National Ambient Air Quality Standards include primary and secondary standards for various pollutants. The primary standards are mandated by the CAA to protect public health, while the secondary standards are intended to protect the public welfare from adverse impacts of pollution, such as visibility impairment.
Clean Air Act Amendments of 1990	Establish new federal non-attainment classifications, new emissions control requirements, and new compliance dates for areas in non-attainment. The requirements and compliance dates are based on the non-attainment classification.
Clean Water Act (CWA) of 1977 as amended (33 USC 1251 et seq.)	Prohibits the discharge of pollutants from a point source into navigable Waters of the United States, except in compliance with a National Pollutant Discharge Elimination System (NPDES) (40 CFR Part 122) permit. The navigable Waters of the United States are considered to encompass any body of water whose use, degradation, or destruction will affect interstate or foreign commerce. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. Section 401 of the CWA requires that the discharge of dredged or fill material into water of the United States does not violate state water quality standards. Generally, no CWA Sec. 404 permits will be issued until the State has been notified and the applicant has obtained a certification of state water quality standards.
Coastal Zone Management Act (CZMA) of 1972 (16 USC 2452-24645).	The CZMA plays a significant role in water quality management. Under the CZMA, a Federal action that may affect the coastal zone must be carried out in a manner that is consistent with state coastal zone management programs.

Table 1-1.
Federal and State laws applicable to the implementation of the Proposed Action.

Federal Law	Activity or Requirement
Endangered Species Act (ESA) of 1973 (7 USC 136; 16 USC 460 et seq.)	Declares the intention of Congress to conserve threatened and endangered species and the ecosystems on which these species depend. The ESA requires that federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), use their authorities in furtherance of its purposes by carrying out programs for the conservation of endangered or threatened species.
Section 7 of the ESA (16 USC 1536)	Contains provisions that require federal agencies to consult with the Secretary of Interior and to take necessary actions to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of endangered species and threatened species.
Energy Policy Act of 1992 as amended (42 USC 8256 et seq.)	The Act requires that Federal agencies significantly reduce their use of energy and reduce environmental impacts by promoting the use of energy-efficient and renewable energy technologies.
Migratory Bird Treaty Act (MBTA) of 1918 as amended (16 USC 703-712)	The MBTA implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful.
National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code [USC] 4321-4347)	Requires federal agencies to analyze the potential environmental impacts of major federal actions and alternatives and to use these analyses as a decision-making tool on whether and how to proceed.
National Historic Preservation Act (NHPA) of 1966 as amended (16 USC 470 et seq.)	The NHPA is the key federal law establishing the foundation and framework for historic preservation in the United States. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP); it establishes an Advisory Council on Historic Preservation (Council) as an independent federal entity; it requires federal agencies to take into account the effects of their undertakings on historic properties, and to afford the Council an opportunity to comment upon any undertaking that may affect properties listed, or eligible for listing, in the NRHP; and it makes the heads of all federal agencies responsible for the preservation of historic properties owned or controlled by them.
Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001-3013)	The NAGPRA restores certain rights to Native Americans with respect to the disposition of ancestral human remains and cultural objects; vests ownership of these materials (from federal or tribal lands) with designated Native American groups; requires notification of federal agency head when Native American cultural items are discovered on federal or tribal lands; prohibits trafficking in Native American human remains and cultural items; requires inventory and tribal notification of human remains and associated funerary objects held in existing collections by museums or federal agencies; provides for repatriation of these materials.

Table 1-1.
Federal and State laws applicable to the implementation of the Proposed Action.

Federal Law	Activity or Requirement
Noise Control Act (NCA) of 1972 (42 USC 4901 et seq.)	This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of Federal research and activities in noise control, authorizes the establishment of Federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products. The Act authorizes and directs that Federal agencies, to the fullest extent consistent with their authority under Federal laws administered by them, carry out the programs within their control in such a manner as to further the policy declared in 42 U.S.C. 4901. Each department, agency, or instrumentality of the executive, legislative and judicial branches of the Federal Government having jurisdiction over any property or facility or engaged in any activity resulting, or which may result in, the emission of noise shall comply with Federal, State, interstate, and local requirements respecting control and abatement of environmental noise.
Pollution Prevention Act (PPA) of 1990	This Act establishes that pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and that disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.
Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 et seq.)	This Act gives the Environmental Protection Agency the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes.
State Law	**Activity or Requirement**
California Coastal Act (CCA) of 1976	This Act provides long-term protection of California's 1,100-mile coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the Coastal Commission in its coastal development permit decisions and for the review of local coastal programs prepared by local governments and submitted to the Commission for approval. These policies are also used by the Commission to review federal activities that affect the coastal zone.
Clean Air Act of 1988	This Act develops and implements a program to attain the California Ambient Air Quality Standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than or equal to 10 microns in diameter, lead, sulfates, hydrogen sulfide, and vinyl chloride. 40 CFR Part 51 gives state and local agencies the authority to establish air quality rules and regulations. Rules adopted by the local air pollution control districts and accepted by the Air Resources Board are included in the State Implementation Plan. When approved by the U.S. EPA, these rules become federally enforceable.
Porter-Cologne Water Quality Control Act	Protects all waters of the state for the use and enjoyment of the people of California and declares that the protection of water resources be administered by the regional water quality control boards.

Chapter 2. Description of the Proposed Action and Alternatives

This chapter describes the Proposed Action (Alternative A), the No-Action Alternative (Alternative B), and other identified Alternatives (Alternatives C through F). The chapter includes detailed descriptions of equipment needs, construction requirements, and operational parameters for the Proposed Action and any Alternatives identified as feasible.

The descriptions provided in this chapter are based on information provided by the Space and Missile Systems Center (SMC) Satellite and Launch Control Systems Program Office, Western Range (RNV).

The objective of the proposed project is to construct a docking facility for two command transmitters (VUS Transportable units) that would provide LOS coverage to all launch facilities within Vandenberg AFB.

There are two aspects to the proposed project: 1) The construction of a new WR CT Site with all facilities and components to serve as a primary support docking site for the VUS Transportable units; and 2) the location of the new site.

Construction of the new WR CT Site would entail:

- Grading and paving of access roads, parking areas, and docking pads.
- Installation of two VUS Transportable units.
- Installation of four VUS omni-antenna masts and four VUS directional antennas.
- Installation of a portable office/ maintenance building.
- Installation of a subsurface pipeline for water supply.
- Installation of facility electrical power supply.
- Installation of two portable buildings that will each house electrical switchgear, a stand-by-generator and aboveground fuel tank.
- Installation of a septic waste system.
- Installation of communications system and lines.

The WR CT Site would incorporate all the same components, regardless of the location where the site would be located.

Site selection criteria to evaluate the Proposed Action and viable Alternatives included:

- The location must provide optical LOS to all launch facilities on Vandenberg AFB.
- Water supply, electrical power and communications lines must be available within a reasonable distance so that these utilities can be provided to the site.
- The location must be outside of launch hazard zones to avoid the need for evacuation during launch events.
- The location must be outside of explosives safety zones.
- The location must take into consideration personnel safety in terms of radio frequency (RF) radiation hazards.
- The location must be outside of any air space restriction zones.
- The location must be in an area with minimal environmental constraints that would preclude the establishment of the facility.

2.1 Alternative A: Proposed Action

The site selected under the Proposed Action is approximately 240 feet by 270 feet, located 250 feet west of 13th Street and 1,740 feet south of Watt Road (Figure 2-1). The location for the WR CT Site under the Proposed Action would meet all site selection criteria described above. In addition, this location would reduce the length of the fiber optic cable and would be outside the caution hazard corridor of future Booster Verification launches from the ABRES facility, northeast of Watt Road.

Construction of the WR CT Site under the Proposed Action would affect approximately three acres. Although the entire area would not be developed, for purposes of potential effects to resources in this analysis, the project area is considered to include the three acres where the site would be constructed and a perimeter of approximately 200 feet on all sides, a 240-foot corridor along the overhead power line route, and a 260-foot corridor along the fiber optic lines route (Figure 2-2). Figure 2-3 illustrates the general layout of the proposed WR CT Site.

Construction activities are expected to commence in spring of 2005 and last approximately 10 months, with 8-hour workdays and 5-day workweeks (Table 2-1). Approximately six construction personnel would be required for each activity. However, during the installation of asphalt and concrete foundations, antenna towers and wiring, up to 20 construction personnel may be present at the site.

Table 2-2 provides the estimated types and numbers of construction equipment that would be used for this construction project. Although the exact type of equipment that would be used may vary slightly from these projections, these estimates provide a sound engineering basis for analyzing related issues, such as air quality.

Staging areas for construction equipment and supplies would be established within the project area depicted in Figure 2-2. Whenever possible, construction equipment would be staged on pavement near the site and within the area of disturbance for the project.

Prior to commencement of construction, the construction contractor would identify the proposed staging areas and obtain concurrence from the Environmental Flight Natural Resources Section (30 CES/CEVPN) for the use of the selected sites.

Table 2-1.
Construction times for the proposed WR CT Site.

Activity	Time
Vegetation removal, trenching, excavation and grading	2 months
Installation of fiber-optic lines, power, water and septic waste system	3 months
Installation of asphalt and concrete foundations, antenna towers, and wiring	3 months
Installation of omni-antennas, directional antennas and VUS Transportable units	2 months

Table 2-2
Equipment use during construction of the proposed WR CT Site.

Equipment Description	Number	Anticipated Use (% of 10 months)
Delivery truck	1	80%
Trencher	1	15%
Backhoe	1	50%
Dozer	2	50%
Crane	1	50%
Compactor	1	50%
Dump truck	2	30%
Water truck	1	50%
Concrete truck	4	10%
Generator	1	5%
Boring Jack Unit	1	5%
Asphalt compactor	1	10%
Paver Cat	1	10%
Street Sweeper	1	80%
Light pick-up truck	2	100%
Miscellaneous delivery trucks	2	30%

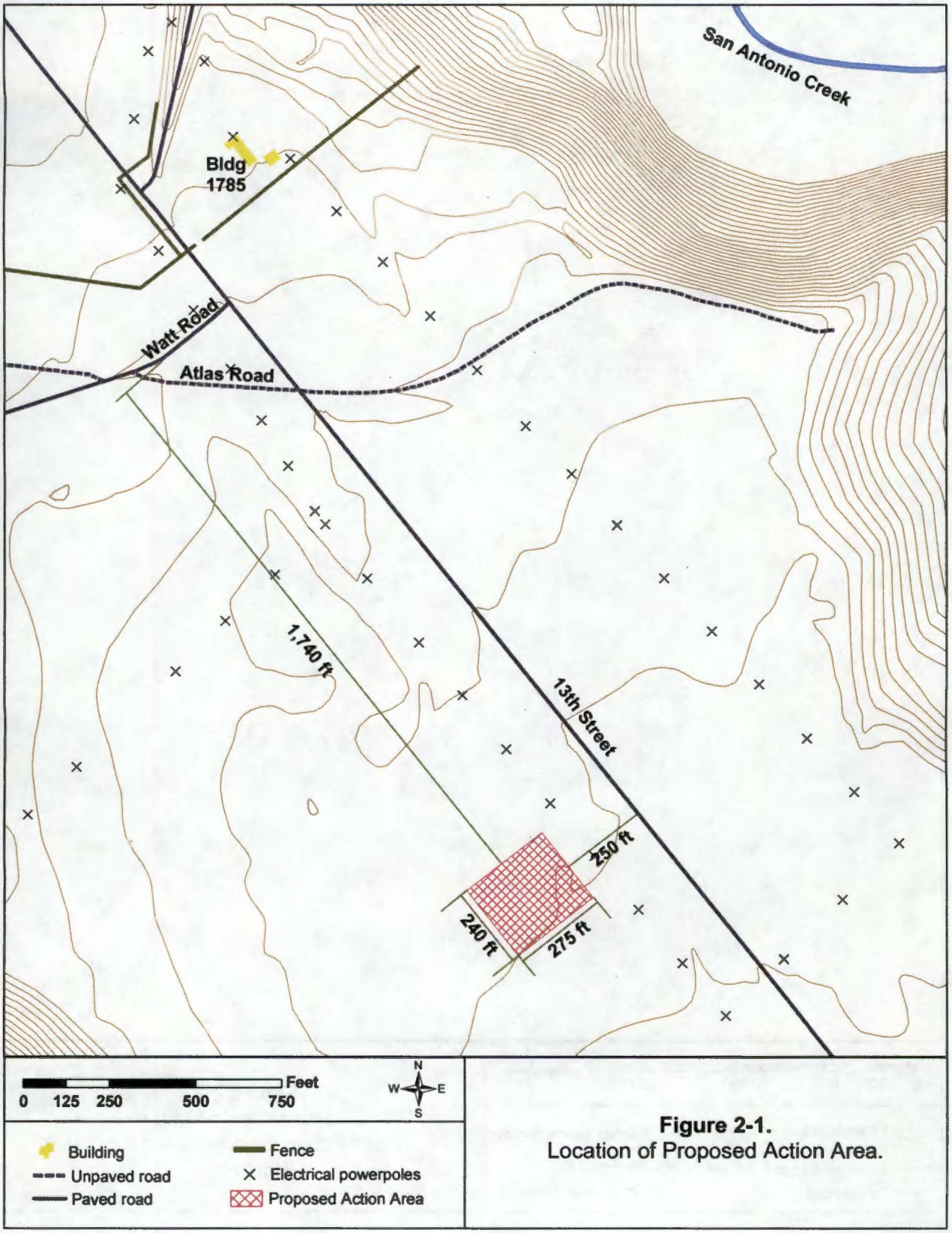

Figure 2-1.
Location of Proposed Action Area.

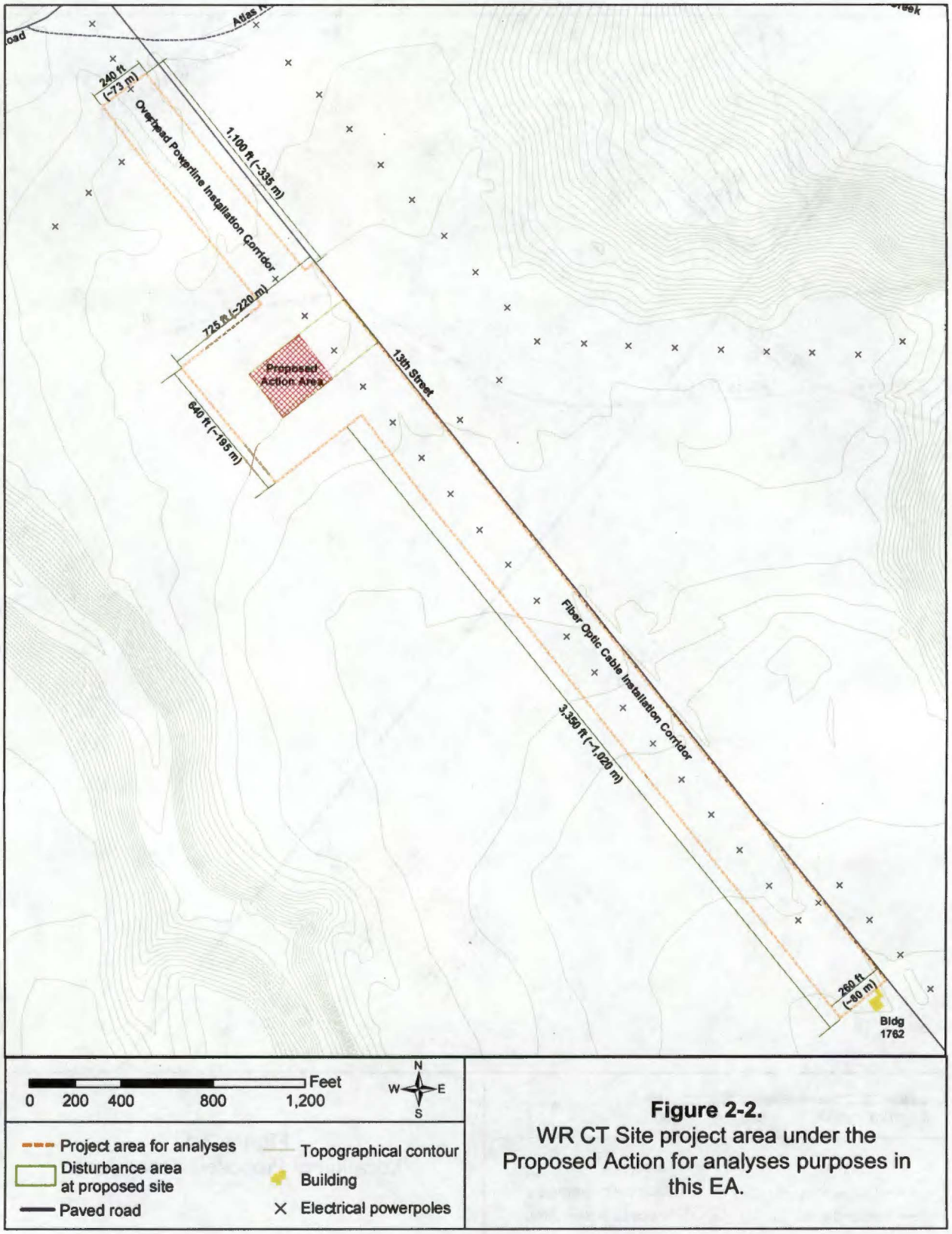

Figure 2-2.
WR CT Site project area under the Proposed Action for analyses purposes in this EA.

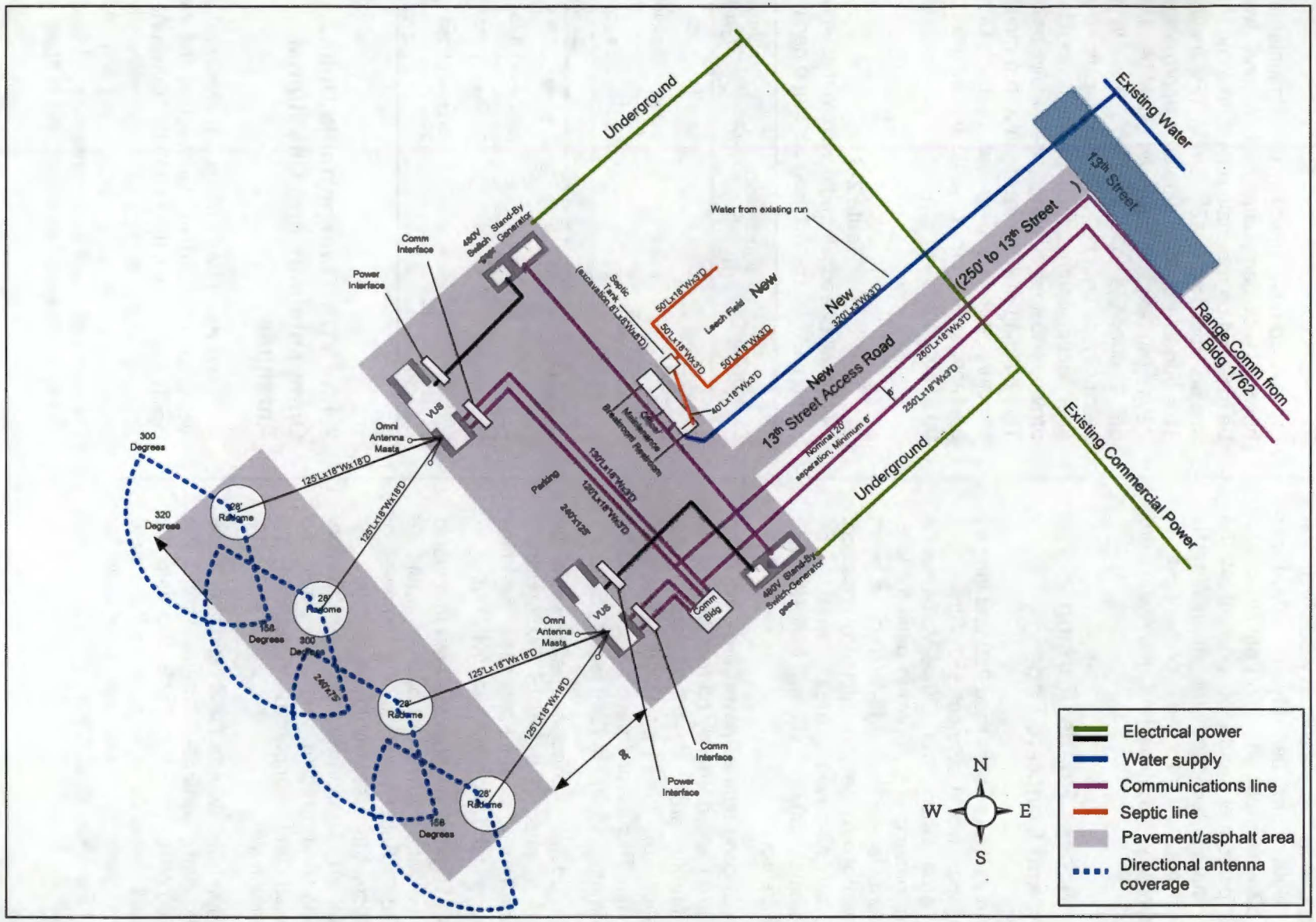

Figure 2-3. General layout of proposed WR CT Site.

During the operational phase of the project, one to two personnel would man the facility eight hours per day, five days per week, 52 weeks per year. An additional two to four personnel would be present at the facility during launches for approximately eight hours. At the present time, approximately 18 launches per year are planned.

2.1.1 Access Roads, Parking Areas, and Concrete Pads

An asphalt access road 250 feet long by 20 feet wide would connect 13th Street to a paved area where the Office/Maintenance building, parking area, docking pads for VUS Transportable units, and other support equipment would be constructed or installed. This asphalt-paved area would be approximately 30,000 square feet (ft^2; 240 feet x 125 feet).

A second asphalt-paved area would be constructed approximately 66 feet west of the main facility area described above, for installation of the four VUS directional antennas. This second paved area would be approximately 18,000 ft^2 (240 feet x 75 feet).

In addition, concrete pads would be installed to support the VUS Transportable units, the four VUS omni-antennas, the office building, and the two generator buildings.

All vegetation within the area that would be paved with asphalt or concrete would be removed. Subsequent to the removal of vegetation, the area would be graded. All excess soils generated from excavation, trenching and grading activities would be distributed and compacted throughout the construction site.

Figure 2-3 depicts the locations of these asphalt and concrete areas within the proposed WR CT Site. Table 2-3 lists the estimated amounts of asphalt and concrete (in cubic yards [yd^3] that would be used for each of the areas described.

2.1.2 Office/Maintenance Building

A portable (mobile) office/maintenance building with composite roof material would be installed on the main paved area, near the access road from 13th Street (Figure 2-3). This portable building would be approximately 720 ft^2 (40 feet x 18 feet) and would be placed on a concrete pad (Table 2-3). Water, electricity, telephone, sewer connections and fiber optic communication lines would be provided to this building (see details below). This building may be replaced with a modular structure within five or six years. During operations, the office would be occupied by up to six personnel.

Table 2-3.
Volumes of asphalt and concrete that would be used for the access roads and pads.

Description	Dimensions (ft)	Material	Volume (yd^3)
Access road	250 x 20	Asphalt	**100**
Office complex and parking	240 x 125	Asphalt	**15,000**
VUS directional antenna pad	240 x 75	Asphalt	**9,000**
Total Asphalt			***24,100***
VUS pads (2)	53 x 15	Concrete	**3,600**
VUS omni-antenna pads (2)	8 x 8	Concrete	**5,000**
Office building	40 x 18	Concrete	**250**
Generator buildings (2)	40 x 18	Concrete	**250**
Total Concrete			***9,100***

2.1.3 VUS Transportable Units, Omni-antennas and Directional Antennas

As described above, a concrete pad would be installed to the west of the main facility area where the two VUS Transportable units would be docked either permanently or temporarily (Figure 2-3). Each VUS Transportable unit would measure 53 feet by 15 feet and would be constructed of steel.

VUS Transportable units contain antenna command controls, and are equipped with two 30-minute back-up, maintenance free batteries. Batteries would be replaced every five years. Used batteries would be disposed of through the Vandenberg AFB Disposal/Recycle program. Figure 2-4 shows the appearance of the VUS Transportable units. The VUS Transportable units would be transported to the WR CT Site on a flatbed truck and installed in place with use of a crane.

Each VUS Transportable unit would incorporate two omni-antennas placed in close proximity to each of the units (10 to 15 feet), and two directional antennas sited approximately 125 feet southwest of each unit. Each antenna would be installed on a concrete pad measuring approximately eight feet by eight feet. The omni-antenna masts would be approximately 100 feet high. Guy wires would be required to stabilize these antennas. Appropriate daytime visual markers on the wires to prevent collisions by avian species would be incorporated following the guidelines and recommendations published by the U.S. Fish and Wildlife Service (USFWS) in September 2000 and accessible through the World Wide Web at http://migratorybirds.fws.gov/issues/towers/comtow.html. In addition, if night warning lights are required for the omniantennas, white strobe lights would be incorporated rather than solid red or pulsating red warning lights. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights (USFWS 2000).

Each of the VUS directional antennas would be placed on an 8-foot high ring wall, have a diameter of approximately 28 feet and total height, including the ring wall of 31 feet. VUS directional antennas would be placed 75 feet apart from each other as depicted in Figure 2-3. Figure 2-5 is an elevation depiction of the omni-antennas and the VUS directional antennas.

Connections between the VUS Transportable units, the omni-antennas, and the directional antennas, would be underground. Connections with the omni-antennas would be either trenched or drive-over protected. Connections between the VUS Transportable units and the directional antennas would be placed in concrete lined trenches with diamond plate coverings. During launches, two operators would be present in each of the VUS Transportable units.

Figure 2-4. VUS Transportable unit.

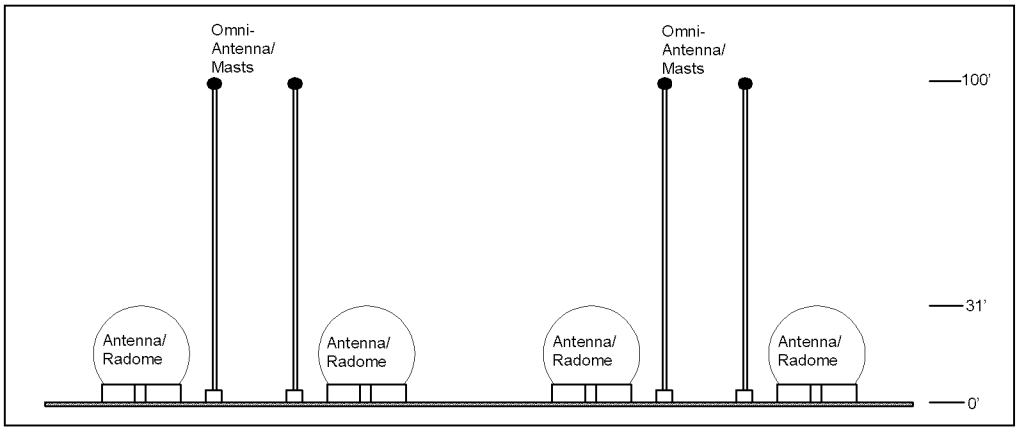

Figure 2-5. Elevation detail of antennas for proposed WR CT Site.

2.1.4 Water Supply

Water would be provided to the site for the Office/Maintenance building via a subsurface 320-foot pipeline installed parallel and to the north of the new access road, and originating at an existing pipeline that runs along the northeast side of 13th Street (Figure 2-3). A backflow prevention assembly would be installed for the 8-inch water main at the 13th Street connection to protect the water supply from contamination due to back siphoning.

The waterline construction process would consist of installing an 8-inch diameter pipeline underground using primarily open trenching technology, with directional boring used underneath 13th Street.

Trenching would involve linearly excavating soil to an approximate width of three feet and an approximate depth of three feet. Temporarily displaced soil would be stockpiled immediately adjacent to the trench. The bottom of the trench would be backfilled with weed-free granular materials. After the pipeline is placed into the trench, the remaining portion of the trench would be backfilled and compacted with the stockpiled soil.

The width of the construction corridor for installation of the water pipeline would be approximately 30 feet. All excess soil generated from the trenching activities would be used as backfill and/or distributed and compacted within the construction site.

Directional boring would involve drilling a pilot borehole into the ground, and continuing the borehole underground until it reaches the designated end point, wherein the borehole would terminate at the ground surface. A surface-operated drilling device is then angled into the ground from the surface at the pilot hole and directed to its destination using a radio-controlled mole containing a cutter head. Personnel operating the mole control the depth and direction of excavation. The borehole would extend to a depth of approximately five feet below grade. A truck-mounted generator would be used to power the equipment at the drill site.

During the typical boring process, bentonite slurry is pumped through the borehole to lubricate the drill bit, carry drill cuttings to the surface, and prevent the bore tunnel from collapsing. Material safety data information on bentonite is provided in Appendix A. The slurry is typically stored in tanks at the drill site when not in use. After the bore is completed, any excess slurry remaining is removed from the site and either reused by the drilling contractor or disposed of at an appropriate facility.

Although highly unlikely, drilling slurry can escape the borehole through fissures or cracks in the soil and then reach the ground surface. Erosion control and containment measures included in the Storm Water Pollution Prevention Plan (SWPPP) and Environmental Protection Plan (EPP) would be implemented, as specified in these plans.

2.1.5 Electrical Power Supply

Five hundred Kilovolts-Ampere (KVA) of electricity would be supplied to the new WR CT Site. Electrical power would originate at an existing power line (P7-12KV) that runs southwest, west of 13th Street. This line connects directly with an abandoned-in-place line (B1-12KV) that runs parallel to and west of 13th Street.

A new line would be connected to P7-12KV at the point where it drops down to connect to B1-12KV west of 13th Street. The new line would then be extended south on the abandoned-in-place B1-12KV line to the proposed WR CT Site. Existing power poles would be maintained and used to extend the power line to the north and south sides of the proposed site, thus eliminating the need to erect new power poles.

The new line would be dropped underground at two poles closest to the northern and southern sides of the proposed site, and run underground for approximately 75-100 feet at a depth of four feet to the two proposed power switchgear and generator buildings (Figure 2-6). From here, power lines would be run underground to each of the two VUS docking stations and each of the four VUS directional antennas. Power to the Office/Maintenance building would be provided through an underground line from the switchgear box at the northeast corner of the building (Figure 2-6).

Trenching would involve linearly excavating soil to an approximate width of three feet and an approximate depth of four feet. Temporarily displaced soil would be stockpiled immediately adjacent to the trench. The bottom of the trench would be backfilled with weed-free granular materials. After the power line is placed into the trench, the remaining portion of the trench would be backfilled and compacted with the stockpiled soil.

The width of the construction corridor for installation of the power lines would be approximately 30 feet. All excess soil generated from the trenching activities would be used as backfill and/or distributed and compacted within the construction site.

2.1.6 Generators and Fuel Storage Tanks

Two 750 Kilowatts (Kw) diesel generators would be installed at the proposed WR CT Site to serve as stand-by power supply. The generators would be placed at the northeast and southeast corners of the proposed site within two mobile buildings (40 feet x 18 feet), adjacent to the electrical switchgear boxes (see Figure 2-3). The generators would be operated for approximately two hours every month for maintenance purposes, and would be used as required during power outages. Usage would not exceed 200 hours per year.

Fuel storage for the generators would be within the same mobile buildings in two 1,320-gallon capacity above ground tanks (one for each generator). Structural concrete containment and manual open/close valves would be incorporated into the design to manage storm water discharges (to grade) associated with each of the fuel tanks. Storm water discharges from fuel tank areas will require coordination with 30 CES/CEV and completion of Discharge to Grade Request Forms. The proponent would prepare a Spill Prevention and Countermeasures Plan. In addition, the proponent would provide the necessary information to add these aboveground tanks to the Vandenberg AFB Aboveground Storage Tank (AST) Inventory, and develop a Hazmat Business Plan.

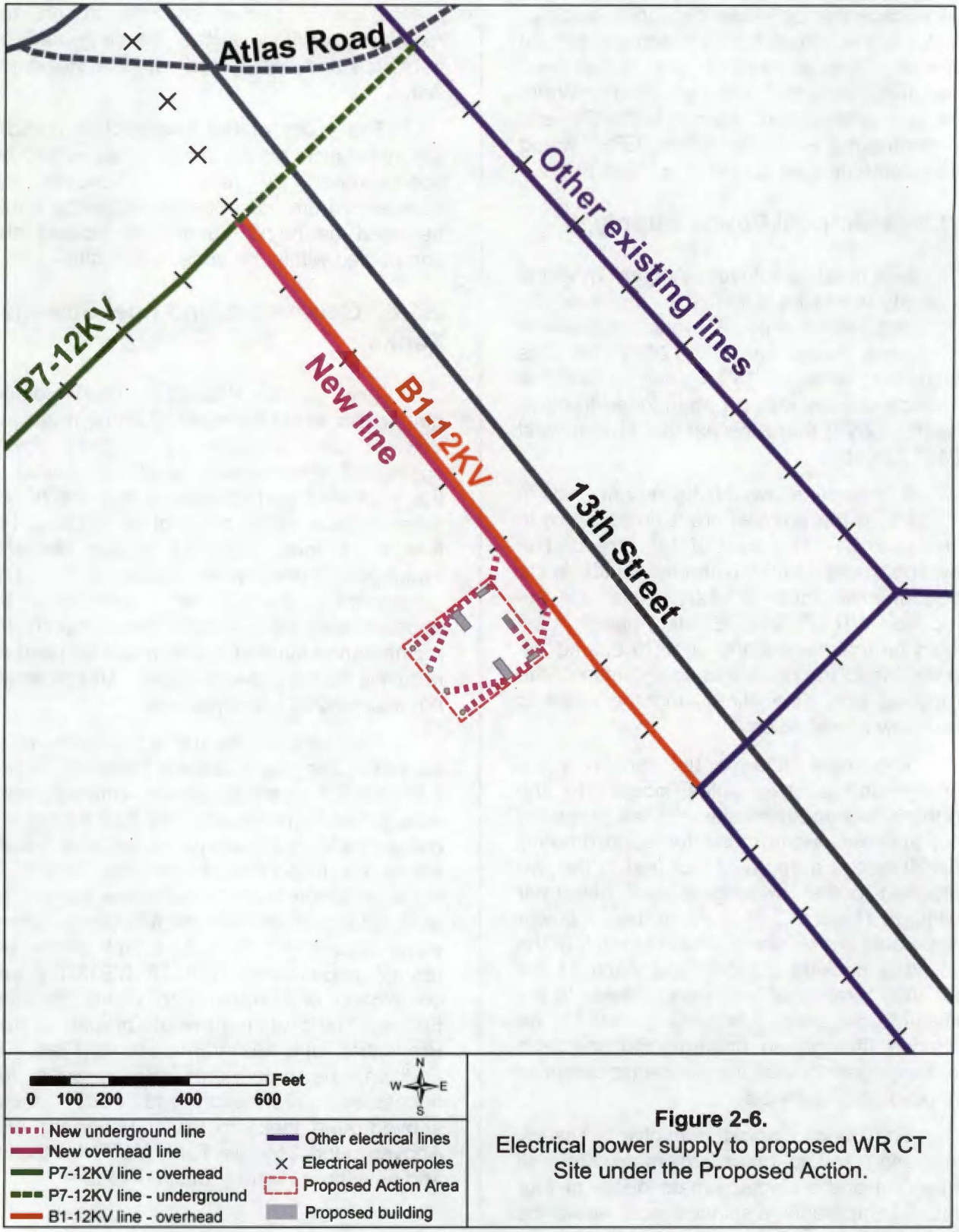

Figure 2-6.
Electrical power supply to proposed WR CT Site under the Proposed Action.

The SBCAPCD is proposing rule changes that take effect in 2005. These rules will impact the air quality operations requirements of this project in terms of type of operations and operational hour constraint requirements. These new rules may include potential new permits and source reviews for both internal combustion engines and generators. The Satellite and Launch Control Systems Program Office, Western Range, as the proponent, should contact 30 CES/CEV, Environmental Management Office to ensure compliance of their operations with these new proposed rules.

Both mobile buildings may be replaced with modular structures within five or six years.

2.1.7 Septic Waste System

A septic waste system would be installed to service the office/maintenance building (Figure 2-3). The system would be installed to the north of this building and would consist of a 1,000-gallon capacity underground septic tank.

Installation of the septic system would entail the excavation of an area approximately eight feet long, eight feet wide and eight feet deep for placement of the septic tank, and three trenches approximately 18 inches wide and three feet deep for placement of the two 50-foot leach field pipelines.

Trenching would involve linearly excavating soil to an approximate width of 18 inches and an approximate depth of three feet. Temporarily displaced soil would be stockpiled immediately adjacent to the trench. The bottom of the trench would be backfilled with weed-free granular materials. After the leach line is placed into the trench, the remaining portion of the trench would be backfilled and compacted with the stockpiled soil.

All excess soil generated from the excavation and trenching activities would be used as backfill and/or distributed and compacted within the construction site.

2.1.8 Communications

Two subsurface fiber optic cables would be installed to provide communications lines for the proposed WR CT Site. The fiber optic cables would originate at Building 1762 on 13th Street (Figure 2-7), approximately 3,600 feet south of the Proposed Action site. The cables would be installed in parallel conduits along the western road shoulder of 13th Street from Building 1762 to the south side of the new access road. At this point the route would proceed parallel to and south of the new access road, along the road shoulder, extend to a communications structure (approximately 10 feet wide by 15 feet long and 4 feet high) to be installed on the southeast side of the new WR CT Site and to various other structures and buildings throughout the facility (Figure 2-7).

A redundancy requirement specifies duplicate fiber optic cable lines must be installed with a six-foot separation so as to provide immediate, back-up service in the event the main lines are damaged. Each of the two lines would have a total length of approximately 3,900 feet. The width of the construction corridor for placement of the fiber optic lines would be approximately 25 feet. Due to potential preexisting subsurface utilities along 13th Street, the lines may need to be placed some distance from the immediate road shoulder, not to exceed 60 feet.

The conduit and lines would be installed by trenching, which involves linearly excavating soil to an approximate width of 18 inches and an approximate depth of three feet. Temporarily displaced soil would be stockpiled immediately adjacent to the trench. Once the trench is excavated, the conduit is laid down into the trench by hand. A skip loader would follow to replace the excavated soil. During the backfill process, a size 12 American Wire Gauge (AWG) would be placed inside one of the conduits (uppermost preferred) as a tracer wire. All excess soil generated from the trenching activities would be used as backfill and/or distributed and compacted within the construction site.

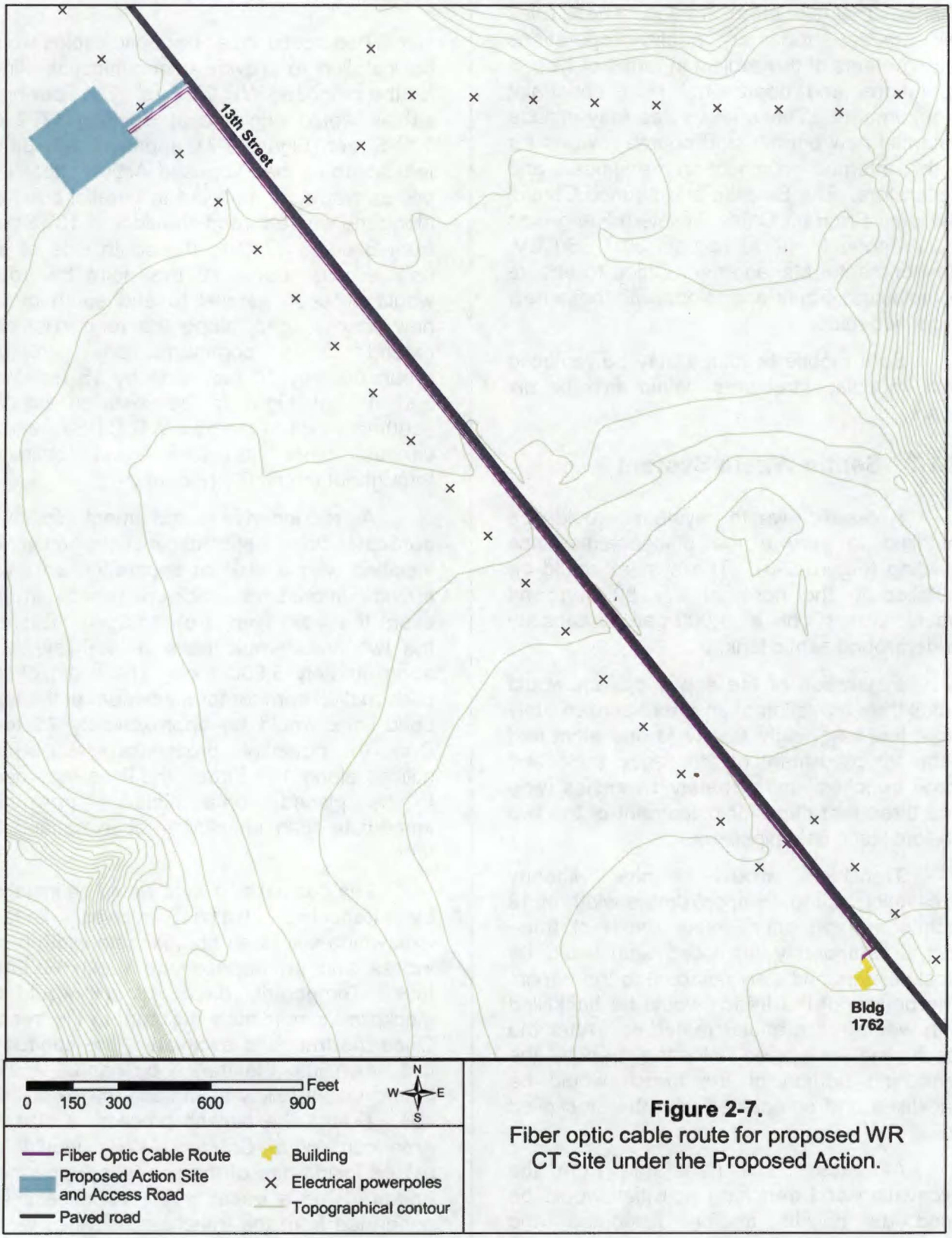

Figure 2-7.
Fiber optic cable route for proposed WR CT Site under the Proposed Action.

2.1.9 Construction Constraints and Monitoring Measures

Potential adverse impacts to resources would be avoided or minimized during construction activities associated with the Proposed Action through implementation of the project constraints and monitoring measures outlined below.

2.1.9.1 Biological Resources

1. A qualified biologist would conduct pre-construction surveys immediately prior to the start of any activities within the APE to identify special status plant species (i.e., Gaviota tarplant, Kellogg's horkelia) needing protective measures. Special status plant species identified within the APE would be isolated and protected from disturbance. During site grading and removal of vegetation, a qualified biologist would conduct daily pre-construction surveys to relocate any reptile, amphibian or mammalian species that are in the path of construction vehicles to suitable habitat adjacent to but outside the construction limits.
2. If feasible, clearing of vegetation within the area of direct disturbance would occur during the non-breeding season (September through February) to avoid adverse impacts on breeding avian species. In the event clearing of vegetation within the area of direct disturbance occurs during the breeding season (March through August), surveys would be conducted for breeding avian species immediately prior to the beginning of vegetation clearing. If any nests are found within the area of direct disturbance, no clearing of vegetation would occur until the eggs are hatched and the young fledged. If nests were found near to but outside the direct disturbance area, they would be monitored for potential disturbance resulting from noise.
3. Pre-construction surveys would be conducted immediately preceding construction activities (regardless of the time of year) to document whether Western burrowing owls are present at the site. If non-nesting burrowing owls are present, they would be located, flushed from burrows and a qualified biologist would close the burrows to avoid risk of owl injury or burial during construction.
4. If new power poles are required to be installed, measures for raptor-safe power pole and power line construction would be incorporated into the design to prevent risk of electrocution to large raptors.
5. If warning lights for omniantennas are required, white strobe lights will be used. The use of solid or pulsating (beacon) red lights will be avoided to minimize potential for night-migrating birds and bat collisions.
6. Any guy wires incorporated in the antenna installation will include daytime visual markers to prevent collisions with diurnally moving avian species.

2.1.9.2 Cultural Resources

In the event that previously undocumented cultural resources are discovered during construction activities, guidelines set forth in the Vandenberg AFB Integrated Cultural Resources Management Plan will be followed.

2.1.9.3 Air Quality

1. Water will be applied, preferably reclaimed, at least twice daily to dirt roads, graded areas, and exposed dirt stockpiles to prevent excessive dust at the staging areas. Chlorinated water would not be allowed to run into any waterway.
2. Vehicle speeds will be minimized on exposed earth.
3. After completion of construction activities, watering, revegetating, or spreading soil binders to prevent wind erosion of the soil will treat disturbed soil.
4. Ground disturbance will be limited to the smallest, practical area and to the least amount of time.

5. Personnel will be designated to monitor construction to ensure that excessive dust is not generated at construction sites.
6. The contractor will implement practices to reduce engine run and idle times.

2.1.9.4 Water Resources

1. The contractor will submit a Notice of Intent (NOI) to the Regional Water Quality Control Board (RWQCB), to comply with the state National Pollutant Discharge Elimination System (NPDES) General Permit,.
2. A SWPPP developed by the construction contractor and approved by 30 CES/CEV will be implemented. This plan will include preventative maintenance measures for construction equipment, spill prevention and response measures, sediment and soil erosion control measures, and identify measures for management of runoff.

2.1.9.5 Earth Resources

The SWPPP will include Best Management Practices for sediment and erosion control.

2.1.9.6 Hazardous Materials and Waste Management

1. Standard procedures ensuring that all equipment is maintained properly and free of leaks during operation, and all necessary repairs are carried out with proper spill containment, will minimize the risk of accidental spillage.
2. Hazardous materials will be procured through or approved for use by Vandenberg AFB Hazmart to minimize waste. Monthly usage of hazardous materials would be reported to Hazmart to meet state and federal reporting requirements.
3. Hazardous materials will be properly stored and managed in secured areas. Chemical stockpile spill containment, if necessary, will be accomplished to minimize or preclude hazardous releases.
4. The contractor would be responsible for the disposal and/or recycling of all waste generated during the scope of the construction project.

2.1.9.7 Human Health and Safety

Adherence to Federal Occupation Safety and Health Act (OSHA) and Air Force Occupational Safety and Health (AFOSH) regulations would minimize the exposure of workers to health and safety hazards.

2.1.9.8 Environmental Protection Plan

Unless otherwise directed by the Contracting Officer, the primary contractor would be responsible for developing an EPP. The EPP would be submitted to 30 CES/CEV for approval. The EPP explains the methods and procedures used by the contractor to comply with all of the environmental requirements.

2.2 Alternative B: No-Action Alternative

Under the No-Action Alternative, a new WR CT Site would not be constructed. Thus, no adverse environmental impacts associated with construction activities would result.

Under this Alternative, CT-1 would continue to provide support to SLC-3, while CT-3 would continue to provide primary support to SLC-6.

Implementation of the No-Action Alternative would preclude meeting LOS backup and primary-support requirements for EELV program launch facilities at Vandenberg AFB. A decision to not construct the new WR CT Site could result in the EELV program missing critical program objectives.

2.3 Alternative C: New WR CT Site West of 13th Street

The site selected under Alternative C would be the same size as the Proposed Action but located 1,500 feet south of Watt

Road (Figure 2-8). The location for the WR CT Site under Alternative C would meet all site selection criteria described at the beginning of this Chapter. However, this location would result in a longer fiber optic cable route and would be within the caution hazard corridor of future Booster Verification launches from the ABRES facility, northeast of Watt Road.

Construction of the WR CT Site under Alternative C would entail the same construction requirements as the Proposed Action and would incorporate the same components as described under the Proposed Action in Section 2.1. All construction constraints and monitoring methods, as described under the Proposed Action (Section 2.9.1), would also apply under Alternative C. The project area considered for analyses in this EA would be the same as that described under the Proposed Action with the exception that the site itself and the disturbance area would be shifted north by 240 feet.

As indicated above, the fiber optic cable line would be longer under Alternative C. The fiber optic line under this Alternative would be 240 feet longer than under the Proposed Action, totaling a distance of approximately 3,840 feet (Figure 2-8). Installation and construction requirements would remain the same as with the Proposed Action.

Operations under Alternative C would be the same as those described under the Proposed Action.

2.4 Alternatives Eliminated from Further Consideration

The alternatives discussed in this section were considered but eliminated from further analyses for the reasons provided below.

2.4.1 Alternative D: New WR CT Site at Building 1836 Site

Under this Alternative, construction of the WR CT Site would entail all of the components described under the Proposed Action except that the facility would be located approximately 950 feet north of Tod Road and 2,400 feet north of Umbra Road (Figure 2-9).

Consideration was given to this site because the location provides LOS coverage to all launch facilities on Vandenberg AFB, and its proximity to existing fiber optic, electrical power, and water lines.

The Alternative D site is an out of commission, abandoned-in-place facility previously used to launch Atlas spacecraft vehicles. Building 1836 is contained within a controlled area that is currently used to stage Peacekeeper boosters. With the Peacekeeper program anticipated to end sometime in 2006, the assumption was made that the area would become available for alternative uses, i.e., the WR CT Site. During the process of assessing this site, it became apparent that although the Peacekeeper program would end in the near future, other programs would continue to use the Peacekeeper booster, requiring the use of this facility. In addition, a Peacekeeper solid fuel storage facility is located nearby, the area is within a test pad (TP-01) caution zone, and the location of this site is within a designated Explosive Safety Zone. For these reasons, Alternative D was eliminated from further analysis in this process.

2.4.2 Alternative E: New WR CT Site at Building 1680 Site

Under this Alternative, construction of the WR CT Site would entail all of the components described under the Proposed Action except that the facility would be located on the east side of Alto Road, approximately 1,100 feet north of the intersection at Aero Road (Figure 2-9). This

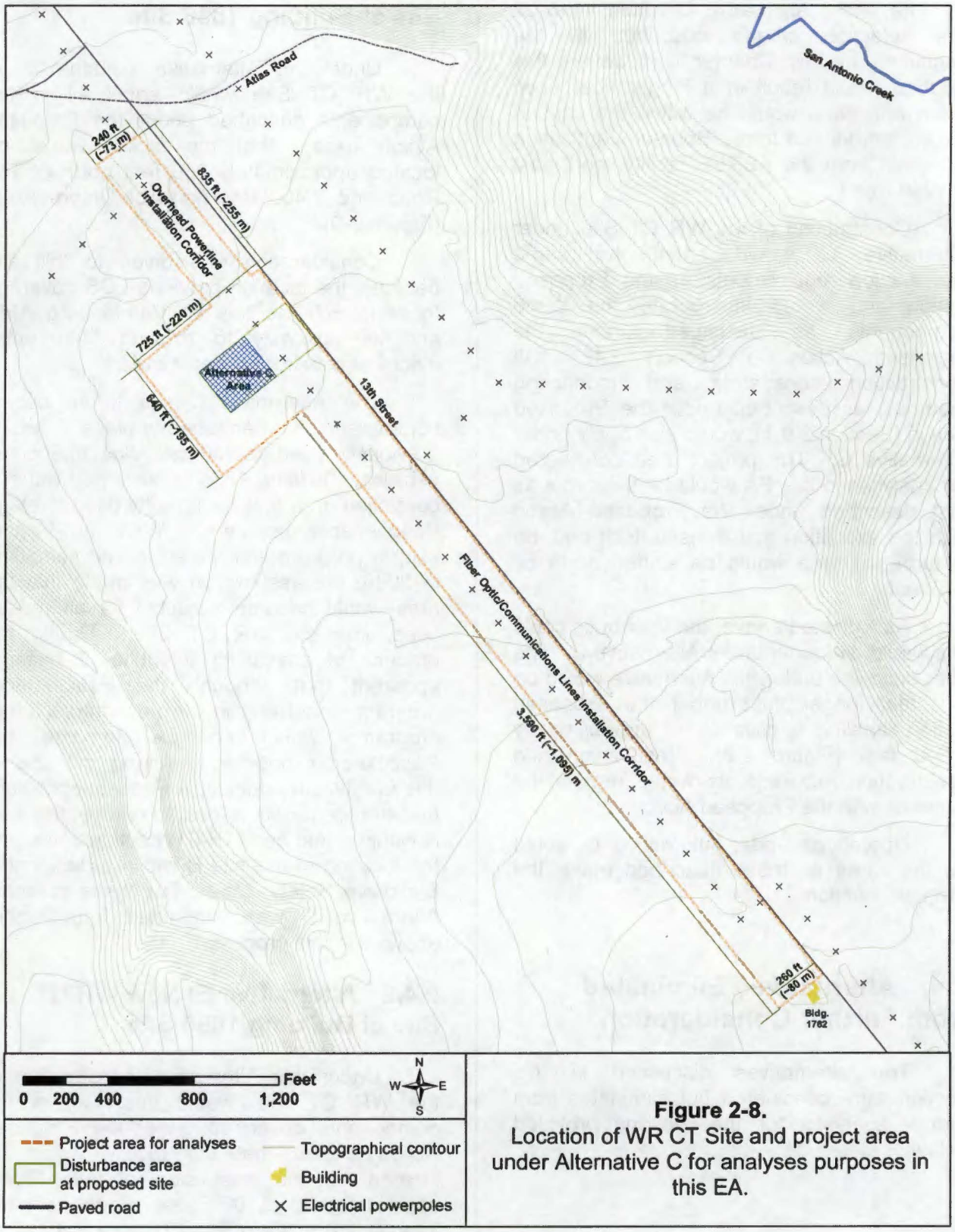

Figure 2-8.
Location of WR CT Site and project area under Alternative C for analyses purposes in this EA.

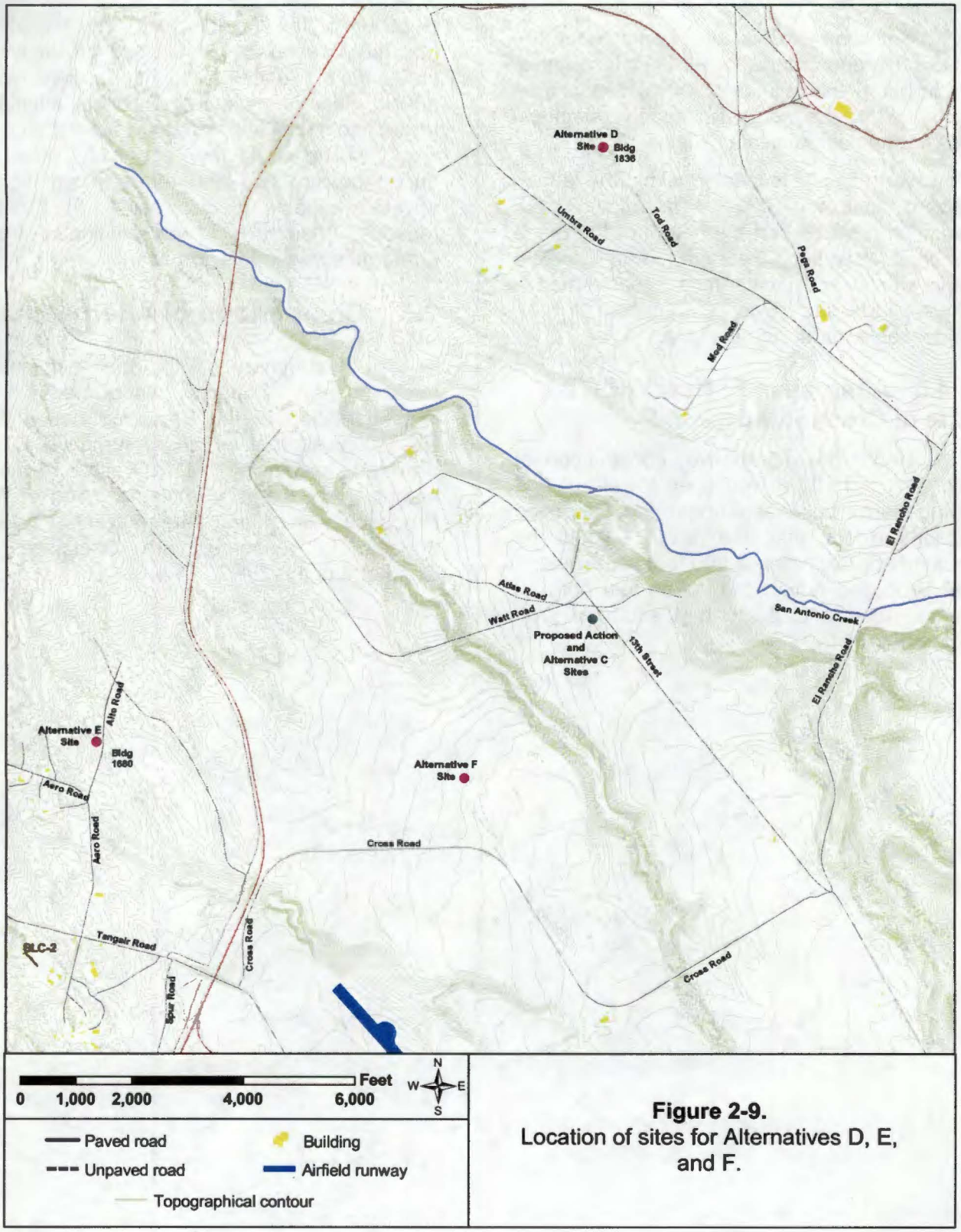

Figure 2-9.
Location of sites for Alternatives D, E, and F.

site is an out of commission facility abandoned for a number of years.

Selection of this site would meet the LOS coverage criteria for all launch facilities. In addition, this site is within a reasonable distance to existing water supply, electrical power and communications lines.

However, this site is located within the launch hazard zone for SLC-2. In addition, RF radiation hazards and the height of the omni-antennas would interfere with airfield equipment and clearance requirements. Thus, this site was determined to be undesirable for further analysis.

2.4.3 Alternative F: New WR CT Site at Cross Road

Under this Alternative, construction of the WR CT Site would entail all of the components described under the Proposed Action except that the facility would be located approximately 3,600 feet southwest of the Proposed Action site, 1,250 feet north of Cross Road and 2,700 feet south of Watt Road (Figure 2-9).

This site is located in an undeveloped area and would meet all listed criteria for selection of the location, with the exception that the location is within close proximity to the airfield, resulting in interference with airfield clearance requirements. In addition, an archeological site is recognized within this area, which could be adversely affected during construction and result in significant adverse impacts if disturbed. For these reasons, Alternative F was eliminated from further analysis in this process.

2.5 Comparison of Alternatives

A summary of the potential environmental impacts associated with implementation of the Proposed Action the No-Action Alternative, and Alternative C, is provided in Table 2-4. Each resource potentially affected by implementation of the Proposed Action and Alternatives is listed. Impacts to resources are discussed in Chapter 4 of this EA.

Table 2-4.
Comparison of alternatives by resource area.

Resource Area	Proposed Action	No-Action Alternative	Alternative C
Biological Resources	Direct disturbance of three acres with potential to affect up to 44 acres. Some construction activities have potential to result in short-term and long-term adverse impacts to biological resources (Section 4.1.1). However, these impacts are considered minor, and construction constraints and biological monitoring would ensure they are minimized or avoided (Section 2.1.9.1).	Construction would not occur. No impacts to biological resources would result.	Direct disturbance affect up to 41 acre would be of the sar those of the Propos 4.1.3), requiring the constraints and mo 2.1.9.1).
Cultural Resources	No impacts to cultural resources are expected to result from construction activities. Activities would not occur near any existing cultural resources (Section 4.2.1). Construction constraints would ensure potential adverse impacts are avoided or minimized (Section 2.1.9.2).	Construction would not occur. No impacts to cultural resources would result.	Activities would not cultural resources (impacts to known c occur. The same g the Proposed Actio 2.1.9.2).
Air Quality	Fugitive dust emissions generated from construction activities have the potential to result in adverse air quality impacts (See Section 4.3.1). Construction constraints would ensure potential adverse impacts are avoided or reduced to a less-than-significant level (Section 2.1.9.3).	Construction would not occur. No impacts to air quality would result	Potential adverse ir magnitude and effe Action (Sections 4.3 same construction measures (Section
Water Resources	No adverse impacts to water resources are expected to result. Construction activities would not occur near any surface waterways that could be affected as a result of erosion. A Notice of Intent to comply with the existing NPDES Permit would be required and a SWPPP would be implemented (Sections 4.4.1 and 2.1.9.4).	Construction would not occur. No impacts to water resources would result.	As with the Propose would occur (Sectio same construction (Section 2.1.9.4).
Earth Resources	No impacts to earth resources are expected to result from construction activities (Section 4.5.1). BMPs would be followed to minimize storm water runoff and erosion (Section 2.1.9.5).	Construction would not occur. No impacts to earth resources would result.	As with the Propose would occur (Secti same construction would be required (

Resource Area	Proposed Action	No-Action Alternative	Alternative C
Hazardous Materials and Waste Management	Materials and wastes generated would be managed consistent with applicable federal, state and regional regulations. No adverse impacts are expected (Sections 4.6.1 and 2.1.9.6).	Construction would not occur. No impacts from hazardous materials and hazardous waste would occur.	As with the Propose would occur (Sectio same construction (Section 2.1.9.6).
Land Use and Aesthetics	No conversion of prime agricultural land or a decrease in land utilization would occur. The aesthetic quality of the area would not be altered as a result of construction. No adverse impacts would occur. Vandenberg AFB will request concurrence with a Negative Determination from the California Coastal Commission (Section 4.7.1).	Construction would not occur. No impacts to land use and aesthetics would result.	As with the Propose would occur (Sectio Concurrence with a the California Coas required.
Utilities	A negligible increase in electrical and water usage is expected as a result of construction and operation of the proposed WR CT Site. Wastewater generated during construction would be transported to the Lompoc Regional Wastewater Treatment Plant. Once construction is completed, wastewater will not be generated. No adverse impacts are anticipated (Section 4.8.1).	Construction would not occur. No impacts to utilities would result.	As with the Propose would occur (Sectio
Human Health and Safety	No adverse impacts are expected to occur with implementation of appropriate and established safety procedures (Sections 4.9.1 and 2.1.9.7).	Construction would not occur. No impacts to human health and safety would result.	As with the Propose would occur (Sectio

Chapter 3. Affected Environment

This chapter describes the existing environment near and within the project area for the Proposed Action and Alternatives analyzed in this EA. The area considered for most resources was confined to the immediate area of the proposed WR CT Site. For some environmental resources, a wider regional area was used, as appropriate. Resources that would not be affected by the implementation of the Proposed Action and Alternatives are not discussed in detail in this chapter.

3.1 Biological Resources

Vandenberg AFB is located in northwestern Santa Barbara County, in a transitional, ecological region that includes the northern and southern distributional limits for many species and, as such, supports a high diversity of biological resources, including many state and federal special status species.

For purposes of evaluating the affected environment for the construction of the WR CT Site, an Area of Potential Effects (APE) was defined as the project area and a perimeter of approximately 200 feet on all sides, a 240-foot corridor along the overhead power line route, and a 260-foot corridor along the fiber optic lines route (Figure 3-1).

3.1.1 Methodology

The APE was surveyed and habitat types were identified based on plant communities. Detailed descriptions of habitat types are included in Section 3.1.2. Complete lists of plant and wildlife species documented within the survey area can be found in Appendix B.

A literature search, general biological survey, and special-status species survey were used to characterize the biological resources within the APE. Field surveys were conducted in September of 2004.

General wildlife surveys were conducted in conjunction with the plant surveys and habitat delineations. Wildlife surveys consisted of direct identification of species via visual and acoustical characteristics, and indirect identification via tracks and sign. Due to the nocturnal nature of many mammal species, identification of mammals relied heavily on tracks and signs such as scat.

Because avian species are highly mobile, avian species that were either seen or heard from the edge of the survey area were also recorded.

Potential occurrence of special status and sensitive species not detected during biological surveys was determined based on the presence of suitable habitat and/or known occurrence of the species. Sources used to determine potential occurrence include:

- California Natural Diversity Database (CNDDB; California Department of Fish and Game [CDFG] 1999, 2001, 2004a, 2004b).
- Existing local and regional references (Christopher 1996, 2002; Coulombe and Mahrdt 1976; Holmgren and Collins 1999; Keil and Holland 1998; Lehman 1994).

3.1.2 Botanical Resources

The botanical surveys identified Central Coastal Scrub as the prevalent plant community within the survey area (Table 3-4). A ruderal community is present along the road shoulders.

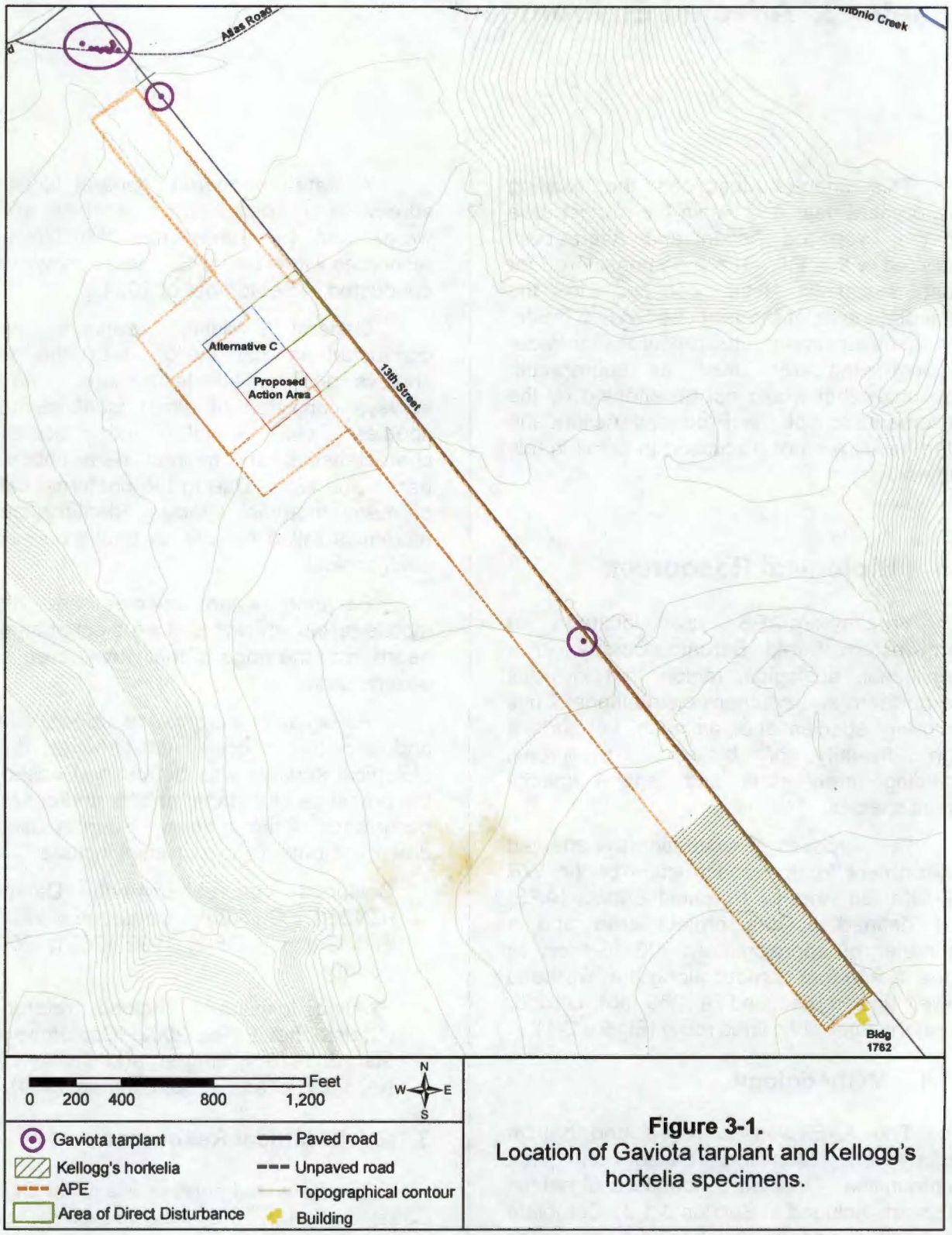

Figure 3-1.
Location of Gaviota tarplant and Kellogg's horkelia specimens.

Both plant communities are described in detail below. Where suitable, nomenclature follows Holland (1986). A complete list of plant species observed during the 2004 surveys is provided in Appendix B. Plant species nomenclature follows Hickman (1993).

Table 3-1.
Acreage of Central Coastal Scrub found within the APE for the WR CT Site project.

Project Area APE	Acreage
Proposed Action Area	44
Alternative C Area	41

Central Coastal Scrub

Coastal scrub is a diverse community that occupies a narrow corridor extending along almost the entire coast of California. Shallow-rooted, mesophyllic plant species that are often drought-deciduous and summer-dormant characterize this community. It ranges from the dry slopes and soils near the coast to the interior foothills (Holland 1986). It is present on approximately 25,000 acres, roughly 25 percent (%), of Vandenberg AFB (USAF 2003).

Common associates of this vegetation type include California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), silver lupine (*Lupinus chamissonis*), coastal buckwheat (*Eriogonum parvifolium*), California broom (*Lotus scoparius*), and poison oak (*Toxicodendron diversilobum*). Two special status plant species, Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*), and black-flowered figwort (*Scrophularia atrata*), occur in this habitat type.

Central Coastal Scrub was present throughout the entire survey areas (Table 3-1). Past disturbances, including construction and maintenance, have resulted in the degradation of this community, allowing non-native grass species to become established. Due to its ability to colonize/recolonize disturbed areas, coyote brush (*Baccharis pilularis*) is the overwhelmingly dominant scrub component. Throughout the survey area, shrubs are scattered or present in small clumps with various forbs and grasses growing in the intervening areas. Veldt grass (*Ehrharta calycina*) is the dominant herbaceous species.

Ruderal

Ruderal plant communities occur at roadsides, waste areas, and other sites continuously disturbed by activities such as traffic and mowing. Ruderal communities are dominated by annual, and usually non-native, forbs and grasses that can rapidly invade disturbed areas.

Common ruderal species include yellow star thistle (*Centaurea melitensis*), various non-native grasses (*Avena barbata*, *Ehrharta calycina*, and *Bromus sp.*) sour clover (*Melilotus indicus*), and cutleaf plantain (*Plantago coronopus*). Two special status plant species, Kellogg's horkelia, and Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), occur in this habitat type.

Although not represented in Table 3-1, within the survey area this community occupies the one to three foot margin bordering the roadsides of 13th Street and Watt Road.

3.1.3 Wildlife Resources

Coastal scrub provides important foraging and breeding habitat for a variety of wildlife species including western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), gopher snake (*Pituophis catenifer*), western rattlesnake (*Crotalus viridis*), western toad (*Bufo boreas*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), bobcat (*Lynx rufus*), brush rabbit (*Sylvilagus bachmani*), various mice of the genus *Peromyscus*, California quail (*Callipepla californica*), bushtit (*Psaltriparus minimus*), wrentit (*Chamaea fasciata*), red-

tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Despite the fact that much of the habitat in this area is degraded, a variety of wildlife species were documented including coyote, mule deer, and loggerhead shrike. A complete list of wildlife species documented within the survey area is presented in Appendix B. This list also includes species not detected during field surveys but potentially present based on prior records in the vicinity and suitability of habitat and occurrence within the region. Surveys for invertebrate species were not conducted.

3.1.4 Sensitive Habitats and Special Status Species

3.1.4.1 Habitats and Plant Species

No sensitive plant communities occur within the APE.

Two special status species, Gaviota tarplant (*Deinandra increscens* ssp. *villosa*), and Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*) were documented within the APE for the WR CT Site project (Table 3-2). One additional special status plant species, black-flowered figwort (*Scrophularia atrata*), was identified as having the potential to occur. However, given the time of year the plant surveys were completed, this species was not detected. Potential occurrence was determined based on past documentation of special status species within the vicinity of the survey area, on suitability of habitat, and occurrence within the region of a particular species.

Gaviota tarplant

Gaviota tarplant is a widely branched, summer flowering annual that grows on sandy loam soils (CDFG 2000). Gaviota tarplant is endemic to Santa Barbara County. There are many locations of this species on Vandenberg AFB. While most locations are coastal, some extend inland. This plant is most often associated with grasses, and on occasion, with coastal shrubs such as *Baccharis* and *Isocoma*.

Several specimens of Gaviota tarplant were documented in the ruderal community located along the roadsides of 13th Street and Watt Road extending along the eastern side of the APE for the WR CT Site project (Figure 3-1).

Table 3-2.
Federal special status plant species and other plant species of concern that occur or with potential to occur within the APE for the WR CT Site project.

Scientific Name Common Name	Status			Occurrence	Habitat	Bloom Period
	USFWS[1]	CDFG[2]	CNPS[3]			
Deinandra increscens ssp. *villosa* Gaviota tarplant	FE	SE	1B	Documented	Grassland, Ruderal	Jun-Sep
Horkelia cuneata ssp. *sericea* Kellogg's horkelia	FSC		1B	Documented	Central Coastal Scrub, Grassland, Non-native Woodland, Ruderal, Southern Bishop Pine Forest	Apr-Sep
Scrophularia atrata Black-flowered figwort	FSC		1B	Potential	Central Coastal Scrub	Apr-Jun

1 FE = Federal Endangered Species FSC = Federal Species of Concern.
2 SE = State Endangered Species
3 California Native Plant Society (CNPS) 1B = plants rare, threatened, or endangered throughout their range (Skinner & Pavlik 1994).

Kellogg's horkelia

This matting, herbaceous perennial is widely distributed on Vandenberg AFB in Central Coastal Scrub in sandy soils, on old dunes, and on coastal sand hills. *H. cuneata* ssp. *sericea* closely resembles *H. c.* ssp. *cuneata* and is highly variable in this area, which encompasses the southern part of its range. Due to the difficulty of distinguishing between the two subspecies, any *H. cuneata* found during field surveys would be treated as subspecies *sericea* (C. Gillespie, pers. comm.).

This species was documented within the southern section of the APE during the botanical surveys for the WR CT Site project (Figure 3-1).

Black-flowered figwort

Black-flowered figwort is a perennial herb found from southern San Luis Obispo County to northern Santa Barbara County, in coastal dunes, coastal scrub, chaparral and woodlands in calcareous or diatomaceous soils, at elevations less than 500 meters. This species is a common component of coastal scrub communities on Vandenberg AFB.

This species could potentially occur within the APE for the WR CT Site project.

3.1.4.2 Wildlife Species

No federal threatened or endangered wildlife species are known to occur within the APE for the WR CT Site project. However, several federal species of concern occur in coastal scrub including silvery legless lizard (*Anniella pulchra pulchra*), and coast horned lizard (*Phrynosoma coronatum frontale*). In addition, these communities provide foraging and/or breeding habitat for avian species of special concern including Western burrowing owl (*Athene cunicularia hypugea*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Lawrence's goldfinch (*Carduelis lawrencei*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), Allen's hummingbird (*Selasphorus sasin*), and California thrasher (*Toxostoma redivivum*).

Table 3-3 lists federal special status wildlife species and other wildlife species of concern known to occur or that potentially occur within the APE. Potential occurrence was determined based on field surveys conducted for this project, on past documentation of special status species within the vicinity of the survey area, and on suitability of habitat and occurrence within the region of a particular species.

Silvery legless lizard

This ground dwelling lizard is found primarily in areas with sandy or loose organic soils or where there is plenty of leaf litter in coastal dune scrub, valley-foothill scrub, chaparral, and coastal scrub habitat types. Legless lizards can seek cover under surface objects such as flat boards and rocks where they lie barely covered in loose soil, and are often encountered buried in leaf litter or burrowing near the surface through loose or sandy soil. The reproductive season begins with mating activities in late spring or early summer, with live young born September through November.

Suitable habitat for this species occurs within the project area and it has the potential to occur throughout the APE.

California horned lizard

California horned lizards are found in areas with abundant open vegetation, such as coastal scrub and annual grasslands, with loose, sandy soils and an open shrub canopy. These terrestrial lizards are active above ground from April through October and can often be found in the early morning basking on the ground or elevated objects. They avoid predators and extreme heat by burrowing into loose soil. These lizards pass periods of inactivity and winter hibernation under surface objects such as rocks or logs, or in crevices or mammal burrows. The breeding season varies depending on locality, but has been reported to exist mostly from May to June.

Table 3-3.
Federal special status wildlife species and other species of concern that occur or with potential to occur within the APE for the WR CT Site project.

Scientific Name Common Name	Status USFW[1]	Status CDFG[2]	Occurrence	Breeding Season
Reptiles				
Anniella pulchra pulchra Silvery legless lizard	FSC	CSC	Potential	Mate May-Jun Birth Sep - Oct
Phrynosoma coronatum frontale California horned lizard	FSC	CSC	Potential	Apr - Aug
Birds				
Athene cunicularia hypugea Western burrowing owl	FSC	CSC	Potential	Apr - Jun
Aquila chrysaetos Golden eagle	FP	CSC	Potential	Jan - Aug
Buteo regalis Ferruginous hawk	FSC	CSC	Potential	Only winters on Vandenberg AFB
Carduelis lawrencei Lawrence's goldfinch	FSC		Potential	Apr - Sep
Elanus leucurus White-tailed kite	FSC		Potential	Mar - Jul
Lanius ludovicianus Loggerhead shrike	FSC	CSC	Documented	Mar - Aug
Selasphorus sasin Allen's hummingbird	FSC		Potential	Feb - Aug
Toxostoma redivivum California thrasher	FSC		Potential	Jan - Jun

1 FP = Federally Protected (Bald and Golden Eagle Protection Act of 1940) FSC = Federal Species of Concern
2 CSC = California Species of Concern

Suitable habitat for this species occurs within the project area and it has the potential to occur throughout the APE.

Western burrowing owl

Western burrowing owls are year-round residents of open, dry grassland, desert habitats, and open scrub communities. This small owl can be active during the day and night. They usually nest in abandoned ground squirrel (or other small mammal) burrows, although they may dig their own burrows in soft soil. Burrowing owls nest between March and late June. Historical accounts suggest that Vandenberg AFB once supported a resident population of burrowing owls. Presently, peak abundance for burrowing owls occurs in lower elevation grassland and coastal scrub areas of the base, with most sightings reported in the rangeland of Sudden Flats in South Vandenberg AFB (Holmgren and Collins 1999). Breeding has not been reported since 1979-1980, when 4-5 pairs nested in rangelands east of Point Arguello for two consecutive years (A. Naydol pers. comm. 1996).

Burrowing owls were not observed during the biological surveys for the WR CT Site. However, the coastal scrub within the APE provides suitable habitat for this small owl, and migrating/wintering burrowing owls have been known to occur in the past along Watt Road just west of the intersection of Cross Road, within 0.5 mile or less of the proposed project site (N. Francine, pers. comm.).

Golden eagle

Golden eagles typically inhabit rolling foothills, mountain areas, sage-juniper flats, and desert. Rugged, open habitats with canyons and escarpments are used most frequently for nesting, which occurs from late

January through August, with a peak in March through July (CDFG 1990). Golden eagles are occasionally seen throughout Vandenberg AFB and are thought to nest in the local mountains (Lehman 1994). In addition, they may forage in open scrub and grassland habitats. However, these would be expected to be occasional rare sightings.

Suitable breeding habitat for this species does not exist within the APE. However, golden eagles may use habitats such as the coastal scrub within the APE for foraging.

Ferruginous hawk

This species is an uncommon fall transient and winter resident to Santa Barbara County; it is typically observed in coastal and interior grasslands, and agricultural fields. Ferruginous hawks are typically present in California from September to mid April (CDFG 1990). During the winter these hawks often roost communally.

The coastal scrub community located within the APE would provide suitable foraging habitat for this species.

Lawrence's goldfinch

This goldfinch is highly erratic and localized in occurrence; they occur in a variety of open and semi-open habitats, including willow riparian oak woodland and open coniferous forest. Lawrence's goldfinches build nests in the dense foliage of trees or shrubs. The breeding season extends from April to September.

The coastal scrub community within the APE provides suitable foraging and nesting habitat for this species.

White-tailed kite

California contains the largest number of white-tailed kites in North America. Kites have experienced declines in some areas since the 1980s. White-tailed kites forage in grassland and open scrubland habitats where small mammals comprise the bulk of their prey. Their breeding season lasts from March to July. Nests are constructed in shrubs or trees (California Partners in Flight [CPIF] 2000).

Breeding has been documented on Vandenberg AFB (Holmgren and Collins 1999). Suitable foraging habitat exists within the APE.

Loggerhead shrike

This common resident and winter visitor in lowlands and foothills throughout California prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. It builds nests on stable branches of densely foliaged shrubs or trees. The breeding period extends from March through August.

Breeding has been documented on Vandenberg (Holmgren and Collins 1999). This species was documented during field surveys for the WR CT project.

Allen's hummingbird

Allen's hummingbird is a migratory bird that summers along the Pacific Coast of the United States from Oregon to Southern California. This small hummingbird can be found in bushy woods, gardens, flower filled mountain meadows, and parks. The breeding season of this bird typically begins in February and can last through August during which time two broods are typically produced (Gough et al. 1998).

Although Allen's hummingbirds were not detected within the APE during field surveys, they are likely to occur and potentially breed throughout the area.

California thrasher

The California thrasher is endemic to coastal and foothill areas of California. Core habitat, in both coastal ranges and interior foothills, is chaparral. Within chaparral-dominated landscapes, California thrashers also inhabit riparian and oak woodlands, especially where understory shrubs are dense. This species has an extended breeding season (January through July), with

territorial activity intensifying with the start of the winter rains, usually in November. Most pairs raise two broods between February and June. California thrashers are fairly numerous in dense riparian areas and coastal sage scrub of Santa Barbara County.

The coastal scrub community within the APE provides suitable foraging and nesting habitat for this species.

3.1.5 Waters of the United States and Wetlands

For the wetland hydrology criterion to be met a site must be inundated or saturated or exhibit features that show the area was inundated or saturated for the required period of time (i.e., 45 days). A hydric soil is defined as "…a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophilic vegetation (Environmental Laboratory 1987).

No wetlands were documented within the APE during the biological surveys.

3.2 Cultural Resources

A summary of the prehistory and ethnohistory as it relates to the cultural setting is provided in Appendix C.

3.2.1 Existing Resources

An archaeological record and literature search was completed for the Proposed Action (Alternative A) and Alternative C. For purposes of the proposed project, the Proposed Action APE for Cultural Resources consists of the proposed project area, a 240-foot by 270-foot (approximately three-acre) area located 250 feet west of 13th Street and 1,740 feet south of Watt Road. The APE also includes a perimeter of approximately 200 feet on all sides of the proposed project area. In addition, the APE includes a 260-foot wide, 5,090-foot long corridor along the west side of 13th Street between Atlas Road and Building 1762. The corridor extends 240 feet along the overhead power line route to the northwest of the proposed project area and 260 feet along the fiber optic route to the southeast of the proposed project area. Staging areas would be established within this APE. Under the Proposed Action, the proposed project area begins 1,100 feet south of the north end of the overhead power line corridor. Under Alternative C, the proposed project area begins 835 feet from the north end of the overhead power line corridor. The remainder of the Alternative C APE is the same as that for the Proposed Action. The APEs are shown in Figures 2-2 (Proposed Action) and 2-8 (Alternative C).

Due to the similar APEs for the Proposed Action and Alternative C, the record search results apply to both alternatives. This research revealed that 16 surveys or other cultural resource studies have been completed within a 1.0-mile radius of the project area (Table 3-4). The record search also revealed that the entire APE was previously surveyed for archaeological sites (see Section 3.2.2 below for more details). As a result, no pedestrian survey was conducted within the proposed or alternative APEs.

3.2.2 Archival Research

Archival research was completed at the Central Coast Information Center, University of California, Santa Barbara (CCIC-UCSB), and at 30 CES/CEVPC, Vandenberg AFB, California. This effort included a review of literature, archaeological base maps, and cultural resource records. Information was collected for previous archaeological studies within 1.0 mile, and for archaeological sites within 0.25 mile, of the APE. Maps consulted at 30 CES/CEVPC include Vandenberg AFB A-3 series (46 map set), the Base Comprehensive Plan (BCP) Geographic Information System (GIS), and USGS topographic maps. Maps resulting from Palmer's (1999) study of historic resources were also consulted. Earle and Johnson (1999) was consulted for information on areas

Table 3-4.
References for previous archaeological studies recorded within 1.0 mile of the project area.

Surveys or Studies Recorded Within 1.0 Mile	Vandenberg AFB Reference No.	UCSB Reference No.
Glassow 1977	1977-01	V-5
HDR Sciences 1979	1979-2	V-2
Craig 1980	1980-13	V-2
WESTEC Services, Inc. 1981	1981-04	V-16
Neff 1982	1982-05	V-9
HDR Sciences 1982	1981-19	V-8
King 1984	1984-26a	n/a
Roberts 1984	1984-26b	n/a
Advanced Sciences, Inc. 1991	1991-05	
Osland 1992		V-139
Osland 1993	1993-03	V-190
Clark 1997	1997-01	V-159
Denardo 1997	1997-11	n/a
Lebow 1997a	1997-24	n/a
Lebow 1997b	1997-26	n/a
Carbone and Mason 1998	1998-03	
Mirro and Lebow 2003	2003-01	V-218

of potential concern to Native Americans. USGS topographic maps with plotted site and study locations were consulted at UCSB.

Archaeological Studies in the Project Vicinity

Archival research indicates that 17 cultural resource studies have been completed within 1.0 mile of the proposed project (Table 3-4). The entire APE was previously surveyed during the base-wide survey for archaeological sites (Carbone and Mason 1998). Two additional archaeological studies completed within the project area are associated with survey for a wildland fire training area at Thirteenth Street and Watt Road (Osland 1993) and survey for repair of the septic system at Building 1762 (Clark 1997). No cultural resources were recorded within the APE as a result of these studies. Eleven archaeological sites are recorded within a 0.25-mile radius of the APE (Table 3-5). Of these, CA-SBA-3225 is the closest. The site is a low density lithic scatter located on the east side of 13th Street and approximately 800 feet from the APE.

Table 3-5.
Archaeological sites within 0.25 mile of the WR CT project APE.

CA-SBA-592	CA-SBA-3226
CA-SBA-703	CA-SBA-3227
CA-SBA-709	CA-SBA-3229
CA-SBA-2495	CA-SBA-3230
CA-SBA-3224	CA-SBA-3231
CA-SBA-3225	

3.3 Air Quality

Air quality is described by the concentration of pollutants in the atmosphere. These concentrations are expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). Air quality is determined by the type and amount of pollutants emitted into the atmosphere together with the size and topography of the air basin and the prevailing meteorological conditions. Comparing the concentration to state and federal ambient air quality standards determines the significance of any particular pollutant concentration. These standards represent the maximum allowable atmos-

pheric concentrations that may occur while still providing protection for public health and safety with a reasonable margin of safety.

The Clean Air Act (CAA) required the U.S. EPA to establish ambient ceilings for certain criteria pollutants. Subsequently, the U.S. EPA promulgated regulations that set the National Ambient Air Quality Standards (NAAQS). NAAQS have been established for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter 10 microns or less in diameter (PM_{10}), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Of these criteria pollutants, only O_3 is a secondary pollutant, i.e., it is not directly emitted, but is formed from the reaction of nitrogen oxides (NO_X) and reactive organic compounds (ROCs) is used to describe that portion of volatile organic compounds (VOCs) that readily react in the atmosphere and produce ozone. The definition of ROC found in Santa Barbara County Air Pollution Control District (SBCAPCD) Rule 102, *Definitions*, is identical to the U.S. EPA definition of VOC. They are used synonymously in this analysis. The NAAQS are presented in Table 3-6.

Under the California CAA, California established air quality standards for the state, known as the California Ambient Air Quality Standards (CAAQS). CAAQS are generally more stringent than the NAAQS and there are additional CAAQS for sulfates (SO_4), hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particulate matter. The CAAQS are also presented in Table 3-6.

The area affected by the emissions from the Proposed Action includes Vandenberg AFB and the surrounding portions of northern Santa Barbara County. For CO, NO_2, PM_{10}, and SO_2, the affected area is generally limited to a few miles downwind of the emission source, while for O_3 it can extend many miles downwind. Because the reaction between ROCs and NO_Xs usually occurs several hours after they are emitted, the maximum O_3 level can be many miles from the source; therefore, the area affected by Vandenberg AFB-produced O_3 and its precursors could include most of northern Santa Barbara County. In addition, O_3 and its precursors transported from other regions can combine with local emissions to produce high, local O_3 concentrations.

3.3.1 Regional Climate and Meteorology

The climate at Vandenberg AFB can be characterized as cool and wet from October through April and warm and dry from May through September. The average annual rainfall is approximately 14.6 inches, most of which falls between October and May. Winds are usually light during the nighttime hours, reaching moderate speeds of approximately 12 miles per hour by the afternoon. Winds are most often northwesterly on North Base and north to northeasterly on South Base. The strongest winds are associated with rainy season storms.

Vandenberg AFB is subject to early morning and afternoon temperature inversions about 96% and 87% of the time, respectively. In an inversion, air temperature rises with increasing altitude, which confines the surface air and prevents it from rising. This restricts the vertical dispersion of pollutants and, therefore, increases local pollutant concentrations. Pollutants are "trapped" under an inversion layer until either solar radiation produces enough heat to lift the layer or strong surface winds disperse the pollutants. In general, these conditions occur most frequently during the nighttime and early morning hours.

3.3.2 Existing Air Quality

The U.S. EPA classifies air quality within each air quality control region with regard to its attainment of NAAQS. The California Air Resources Board does the same for CAAQS. An area with air quality better than state or federal ambient air quality standards for a specific pollutant is designated as attainment for that pollutant. Any area not meeting those standards is

Table 3-6.
Ambient air quality standards.

Pollutant	Averaging Time	CAAQS[a,c]	NAAQS[b,c]	
			Primary[d]	Secondary[e]
Ozone	8-hour	--	0.08 ppm[f] (157 µg/m^3)	same as primary
	1-hour	0.09 ppm (180 µg/m^3)	0.12 ppm[f] (235 µg/m^3)	
Carbon Monoxide	8-hour	9 ppm (10,000 µg/m^3)	9 ppm (10,000 µg/m^3)	--
	1-hour	20 ppm (23,000 µg/m^3)	35 ppm (40,000 µg/m^3)	--
Nitrogen Dioxide	annual average	--	0.053 ppm (100 µg/m^3) (geo)	same as primary (geo mean)
	1-hour	0.25 ppm (470 µg/m^3)	--	--
Sulfur Dioxide	annual average	--	0.03 ppm (80 µg/m^3)	--
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	3-hour	--	--	0.5 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	--	--
PM_{10}	annual mean (arith or geo)	20 µg/m^3 (geo)	50 µg/m^3 (arith)	same as primary (arith mean)
	24-hour	50 µg/m^3	150 µg/m^3	same as primary
$PM_{2.5}$	annual arith mean	12 µg/m^3	15 µg/m^3	same as primary
	24-hour	--	65 µg/m^3	same as primary
Sulfates	24-hour	25 µg/m^3	--	--
Lead	30-day average	1.5 µg/m^3	--	--
	quarterly	--	1.5 µg/m^3	same as primary
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	--	--
Vinyl Chloride	24-hour	0.010 ppm (26 µg/m^3)	--	--
Visibility Reducing Particles	1 observation (8 hours from 8 AM to 6 PM PST)	sufficient amount to produce extinction coefficient of 0.07 per kilometers due to particles when relative humidity <70%.	--	--

a California Standards for ozone, carbon monoxide, sulfur dioxide (1- & 24-hour), nitrogen dioxide, PM_{10}, $PM_{2.5}$ and visibility reducing particles are not to be exceeded. Sulfate, lead, hydrogen sulfide & vinyl chloride standards are not to be equaled or exceeded.

b National Standards, (other than ozone, particulate matter, and those based upon annual averages or average arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three-years, is equal to or less than the standard. For PM_{10}, the 24-hours standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hours standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature and pressure of 25 ^{O} C and 760-mm Hg, respectively. Most measurements of air quality are to be corrected the reference temperature of 25 ^{O} C and reference pressure of 760-mm Hg; ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

d National Primary Standards: The level of air quality necessary, with an adequate margin of safety to protect the public health.

e National Secondary Standards: The level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f U.S. EPA promulgated new Federal 8-hour Ozone and $PM_{2.5}$ standard on July 18, 1997.

classified as non-attainment. Santa Barbara County is in attainment or unclassified for all the ambient air quality standards except for the state standard for PM_{10} and the state O_3 standards. Currently, Santa Barbara County's air quality is classified as maintenance attainment for the federal 1-hour O_3 standard (68 Federal Register [FR] 40789-40791).

The estimated emissions for Santa Barbara County and Vandenberg AFB are presented in Table 3-7. The Santa Barbara County emissions are 1999 daily planning emissions taken from the 2001 SBCAPCD Clean Air Plan, while the Vandenberg AFB emissions are annual emissions taken from the 2001 Comprehensive Emission Inventory Draft Report.

3.4 Water Resources

Water resources include surface water and groundwater and their physical, chemical, and biological characteristics. Surface water includes lakes, rivers, streams, and wetlands, while groundwater refers to water below the surface. Aquatic and wetlands habitats are discussed in Section 3.1, Biological Resources. Vandenberg AFB encompasses two major drainage basins: Santa Ynez River and San Antonio Creek. Aquifers capable of yielding large quantities of water usable for water supply are generally restricted to these two major drainage basins (USAF 1998). San Antonio Creek and the Santa Ynez River are the primary collection basins for runoff from Vandenberg. Although their collection basins are extensive, flow in these two streams is seasonal because of low precipitation and upstream damming. Higher stream flows occur during the rainy season, which extends from November through May. The project area for the proposed WR CT Site is located within the San Antonio Creek drainage basin. Thus, the region of influence for the proposed WR CT Site includes the San Antonio Creek drainage basin and aquifers within the project area. The APE was defined as the Proposed Action Project Area as depicted in Figure 2-2, and the Alternative C Project Area as depicted in Figure 2-8.

3.4.1 Regional Setting

San Antonio Creek, on North Vandenberg AFB, drains an area of approximately 154 square miles, and discharges into the Pacific Ocean some 28 miles west of its origin in the San Rafael Mountains (Figure 3-2).

San Antonio Creek enters Vandenberg AFB at Barka Slough, a palustrine emergent and forested wetland situated within the San Antonio Creek valley, approximately eight miles east of the Pacific Ocean, and six miles east of the proposed

Table 3-7.
Existing emissions.

Source	1999 Emissions (Tons/Day)				
	CO	NO_x	PM_{10}	ROC	SO_x
Santa Barbara County					
Stationary Sources	3.8486	5.3001	0.9581	8.4711	2.2873
Area-Wide Sources	7.2004	0.7563	23.3440	7.9592	0.0063
Mobile Sources	208.7235	42.4938	0.2404	24.3850	2.0604
OCS Sources	5.7499	29.0837	0.0896	2.8444	20.4629
Total	**225.5224**	**77.6339**	**24.6321**	**43.6597**	**24.8169**
Vandenberg AFB Annual[a]	***1,133.75***	***229.39***	***212.86***	***164.78***	***2.06***

a Emissions are in tons/year.

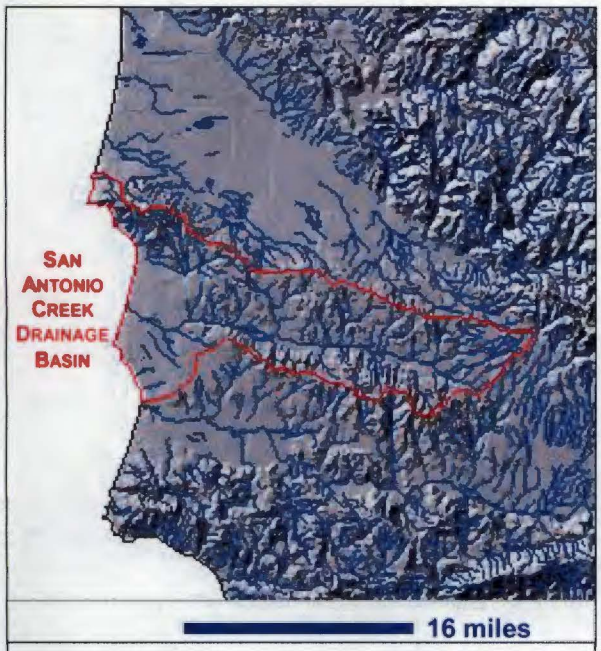

Figure 3-2.
Extent of San Antonio Creek drainage basin.

WR CT Site. The riparian corridor downstream from this area consists of dense willow woodland that persists until the creek reaches the San Antonio Lagoon at its mouth.

At its nearest point, San Antonio Creek is approximately 0.3 miles northeast of the APE for the WR CT Site (Figure 3-3). The drainage basin of San Antonio Creek has a gradient that closely approximates that of its valley. Within the APE for the WR CT Site, the slope is less than one percent (Figure 3-3). The erosion potential for slopes between zero and seven percent is low to moderate (Viers et al. 1998).

3.4.2 Hydrology

The climate of the San Antonio Creek basin is characterized by a wet season and a dry season, with most precipitation (approximately 90%) occurring in the wet season, between November and May. Average annual rainfall throughout the basin is 14 inches, and temperatures range from 40 to 60 degrees Farenheit (°F) during the winter months, and 60 to 80°F during the summer months. Land use throughout most of the watershed includes natural open areas and agricultural uses, with scattered military and domestic uses.

Extensive hydrologic studies of San Antonio Creek were completed between 1998 and 2002 in support of a bridge replacement at El Rancho Road, approximately 0.7 miles upstream of the nearest point to the APE for the WR CT Site (USAF 2002). Analyses included estimations of peak flows, storm runoff volumes and historical high flows along San Antonio Creek from Barka Slough to the Pacific Ocean. The studies used data collected by the U.S. Geological Survey (USGS) between 1956 and 1998 for Gage No. 11136100, located about 1.6 miles upstream from the Lompoc-Casmalia Road bridge (approximately 2.8 miles upstream of the nearest point to the APE for the WR CT Site). The 100-year peak flow was estimated to be 8,710 cubic feet per second (cfs), and the average annual flow was estimated to be 730 cfs; the 100-year storm runoff was estimated at 16,353 acre feet, and the average annual storm runoff was estimated to be 1,260 acre feet (Table 3-8).

Table 3-8.
Summary of peak flows and volumes of San Antonio Creek.

Return period (years)	Peak Flow (cfs)	Storm Volume (acre-feet)
100	8,710	16,353
50	5,520	10,158
25	3,400	5,941
10	1,600	2,745
5	820	1,337
2	220	345
Average Annual[1]	730	1,260

cfs – cubic feet per second.
Source: USAF 2002.

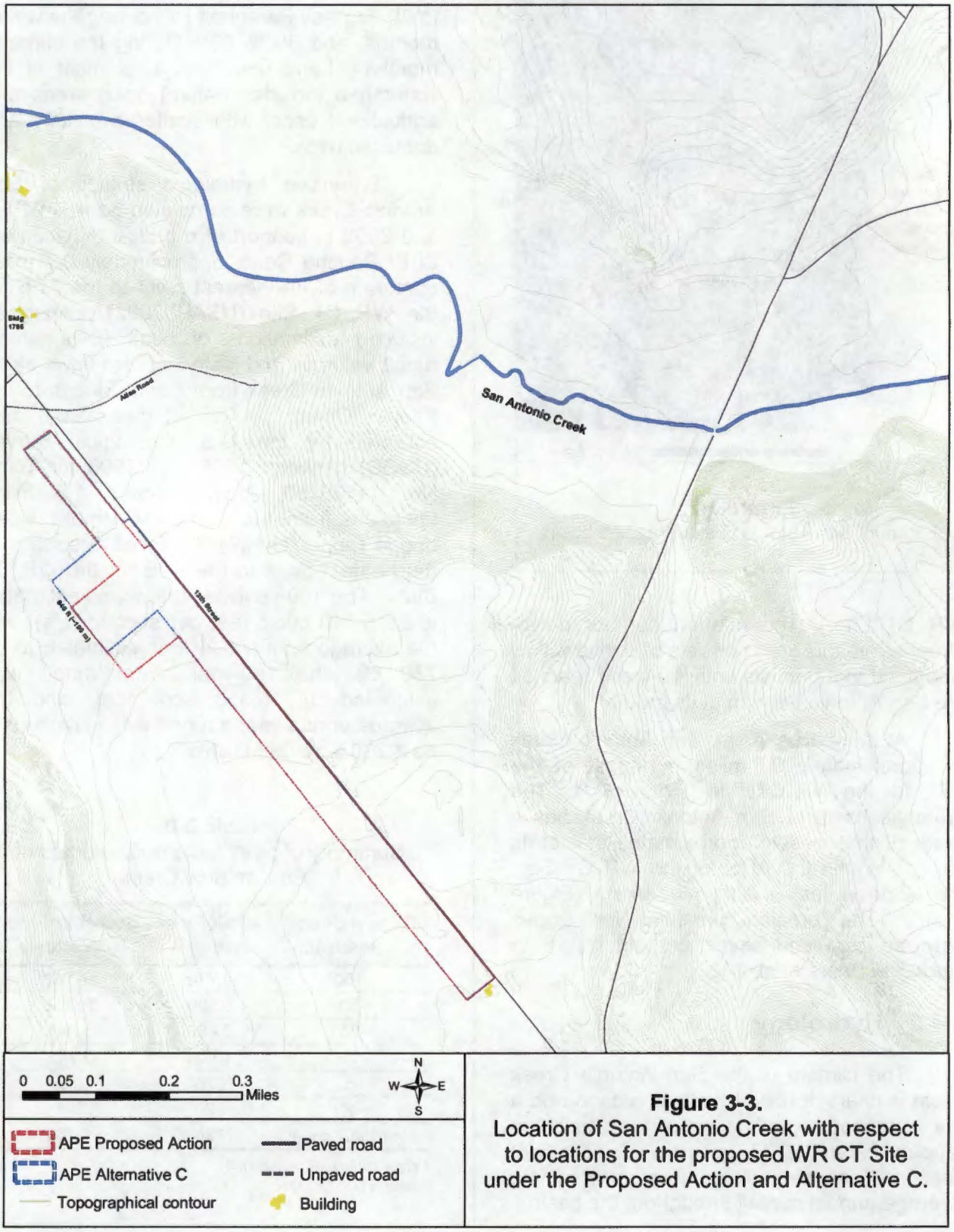

Figure 3-3.
Location of San Antonio Creek with respect to locations for the proposed WR CT Site under the Proposed Action and Alternative C.

3.4.3 Surface Water

The riparian corridor along San Antonio Creek varies in width from 700 to 3,500 feet. The combination of high-density willow vegetation along the corridor, low slope, and large flow area, results in low flow velocities, shallow flow depths, and reduced capacity for sediment transport.

The 100-year floodplain width extends from 940 to 3,500 feet. In the vicinity of El Rancho Road bridge, the southern floodplain boundary is contained by a series of bluffs. The proposed WR CT Site would be located on top of these bluffs (Figure 3-3). Thus, it is outside of the 100-year floodplain.

3.5 Earth Resources

3.5.1 Geology and Soils

Vandenberg AFB is a geologically complex area that includes the transition zone between the Southern Coast Range and Western Transverse Range geomorphic provinces of California. The geologic features of Vandenberg AFB have been an important factor in the development of the diverse natural habitats found in this primarily undeveloped stretch of California coastline. Vandenberg AFB is underlain predominantly by marine sedimentary rocks of Late Mesozoic age (140 to 70 million years before the present) and Cenozoic age (70 million years to the present). The basal unit underlying the entire base is the Franciscan Formation of upper Jurassic age (Dibblee 1950). The Franciscan Formation consists of a series of sedimentary and volcanic rocks with numerous serpentine intrusions. Extensive folding and faulting throughout the Vandenberg AFB area has created four structural regions: the Santa Ynez range, the Lompoc lowland, the Los Alamos syncline, and the San Rafael Mountain uplift (Reynolds et al. 1985). The Santa Ynez range consists of a very thick Cretaceous-Tertiary sedimentary section uplifted along the Santa Ynez fault; it was then subsequently folded. The Lompoc lowland is an area of low relief that is structurally synclinal but has Franciscan basement relatively close to the surface. The Los Alamos syncline is a deep structural down warp traversing the Los Alamos and upper Santa Ynez valleys. Faulting along the southwestern margin of the mountain range uplifted the San Rafael Mountains. The majority of the folds in these structural regions are oriented to the northwest.

The Proposed Action and Alternative C are located within the Burton Mesa landform, which is bounded on the west by the Pacific Ocean, on the north by San Antonio Creek, and on the east by the Purisima Hills. Burton Mesa landform lies within the Santa Maria Basin, a sedimentary trough that lies between the Southern Coast Range geomorphic province to the north and the Transverse Range geomorphic province to the south.

Burton Mesa is a broad, flat plateau that rises approximately 400 feet above the San Ynez River floodplain and mean sea level, and covers an area of about 50 square miles. Drainage from Burton Mesa flows primarily in two directions: south into the Santa Ynez River and northwest into San Antonio Creek and the Pacific Ocean. Recent and older sand dunes extend along the coastal part of the Burton Mesa. The Pleistocene Orcutt Formation is exposed in the inland portion of the mesa.

The dominant soil type within the Proposed Action and Alternative C is a Tangair-Narlon association (Shipman 1972). Tangair soils occur on nearly level to gently sloping terraces at elevations of 40 to 900 feet. These are poorly drained soils with slow or very slow runoff. Narlon soils are found on partially dissected terraces of nearly level to moderate slopes at elevations of 20 to 800 feet. These soils are poorly drained and have slow to medium runoff potential. (Natural Resources Conservation Service [NRCS] 2001). Tangair-Narlon association occurs on nearly level to strongly sloping terrain. Poorly drained sands and loamy sands located

primarily on terraces characterize this association.

3.5.2 Seismology

The Santa Barbara County region is seismically active with a major earthquake occurring in the region about every 15 to 20 years (USAF 1987, Alterman et al. 1994). The three primary fault zones that project through Vandenberg AFB are the Santa Ynez-Pacific Fault Zone, the Lompoc-Solvang (Santa Ynez River)-Honda Fault Zone, the Lions Head-Los Alamos-Baseline Fault Zones, and their potential offshore extensions (Alterman et al. 1994).

These fault systems within the Transverse Ranges are considered active (Jennings 1994) and capable of generating damaging earthquakes. Moderate or major earthquakes along these systems could generate strong or intense ground motions in the area, and possibly result in surface ruptures of unmapped faults along the northern and southern boundaries, as well as the central part of Vandenberg AFB.

3.5.3 Geological Hazards

The region of influence considered for purposes of this EA is Santa Barbara County. The Proposed Action and Alternative C are located in a seismically active portion of Central California. Potential hazards that could affect the site and result in structural damage include faulting, ground shaking, liquefaction, lateral spreading and flooding. The hazards consist of seismically induced settlement, and collapse (hydroconsolidation).

The potential for surface fault rupture on Vandenberg AFB is generally considered to be low (USAF 1987). At the present, there are no known areas where liquefaction has occurred. Areas most prone to liquefaction are those in which there is sandy to silty soil, the water table is within 50 feet of the surface, and earthquake loading exceeds 20% of gravity. The areas most prone to liquefaction on Vandenberg AFB are near San Antonio Creek and the Santa Ynez River. The potential for liquefaction on Vandenberg AFB, despite these areas, is still considered low (USAF 1987).

3.6 Hazardous Materials and Waste Management

Hazardous materials and waste include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, can present substantial danger to public health and welfare or to the environment when released into the environment. These substances are defined as hazardous by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S. Code [USC] 9601-9675), the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA) (42 USC 6901-6992), and Title 22 of the California Code of Regulations (CCR). Executive Order (EO) 12088, under the authority of U.S. Environmental Protection Agency (EPA), ensures that necessary actions are taken for the prevention, management, and abatement of environmental pollution from hazardous materials or waste caused by federal facility activities.

3.6.1 Hazardous Materials Management

Vandenberg AFB uses hazardous materials for its missions and mission support activities. In addition to complying with federal and state regulations, all operators on Vandenberg AFB must comply with 30 SW Plan 32-7086 *Hazardous Materials Management*. All hazardous materials brought onto Vandenberg AFB must be approved and coordinated through the Base Hazardous Materials Pharmacy (Hazmart). Hazardous materials management also requires compliance with California Business Plan regulations (California Health and Safety Code 6.95). Inspections by Base and Santa Barbara County officials verify compliance with hazardous materials requirements.

3.6.2 Hazardous Waste Management

Vandenberg AFB generated an estimated 656 tons of hazardous waste in the year 2000 (Vandenberg AFB 2001). At the present, Vandenberg AFB operates "satellite" and less than 90-day accumulation points. Hazardous waste is manifested and shipped off-site for final disposal by a Defense Logistic Agency approved contractor (30 SW Plan 32-7043A, *Hazardous Waste Management*, February 2001).

The Vandenberg AFB Hazardous Waste Management Plan (HWMP) outlines the procedures to be followed for hazardous waste management and disposal. Implementation of the Hazmart and other Pollution Prevention Program components will continue to reduce hazardous wastes generated on base.

3.6.3 Installation Restoration Program

The federal Installation Restoration Program (IRP) was implemented at Department of Defense (DOD) facilities to identify, characterize, and restore hazardous substance release sites. There are currently 136 IRP sites throughout Vandenberg AFB grouped into six Operable Units based on similarity of their characteristics. IRP sites are remediated through the Federal Facilities Site Remediation Agreement, a working agreement between the Air Force, the Regional Water Quality Control Board – Central Region, and the Department of Toxic Substances Control. In addition to IRP sites, there are identified Areas of Concern (AOC), where potential hazardous material releases are suspected; and Areas of Interest (AOI), defined as areas with the potential for use and/or presence of a hazardous substance.

No IRP, AOC or AOI sites are present within 2,000 feet of the locations selected for the Proposed Action or Alternative C.

3.6.4 Hazardous Materials and Waste Transport

The Department of Transportation (DOT) regulates the transport of hazardous materials and waste. Anyone transporting hazardous materials or waste must obtain U.S. EPA identification numbers as transporters. The U.S. EPA has incorporated DOT regulations (49 USC) into its regulatory scheme, and has added other requirements such as record keeping and cleanup of spills. Transporters of hazardous materials and waste at Vandenberg AFB are regulated by the aforementioned laws and are DOT certified transporters. Vandenberg AFB follows the California Department of Transportation (Caltrans) requirements for traveling with hazardous materials on U.S. Highway (Hwy.) 1, which runs through part of the eastern edge of Vandenberg AFB, and State Route (SR) 246, which physically divides the base into North and South Vandenberg AFB.

3.6.5 Solid Waste

The Vandenberg AFB Class III landfill occupies approximately 172 acres and operates pursuant to Solid Waste Facility Permit #42-AA-0012 issued to the Air Force on January 10, 2000, by the Santa Barbara County Environmental Health Services Department; and pursuant to Waste Discharge Requirement Order No. 94-26 issued on June 3, 1994, by the California Regional Water Quality Control Board. This permit allows the Vandenberg AFB landfill to accept a daily maximum of 400 tons of waste. The average daily volume of solid waste received at the landfill is 30 to 60 tons. The landfill accepts solid waste from base residences, on-base organizations and the U.S. Federal Penitentiary in Lompoc. The 30 SW Solid Waste Management Plan directs the management of all solid waste materials on Vandenberg AFB.

3.6.6 Pollution Prevention

The Pollution Prevention Act (PPA) was enacted in 1990 to refocus the national approach to environmental protection. The PPA has turned the focus of environmental protection toward pollution prevention (P2), which emphasizes source reduction and recycling to reduce impacts to all media. The Air Force has developed a P2 Program to implement the requirements of the RCRA, Hazardous and Solid Waste Amendments (HSWA), and the PPA of 1990. The U.S. Air Force Program requires each installation to develop a Pollution Prevention Management Plan (PPMP) outlining an overall program strategy. The PPMP along with the Hazardous Waste Management Plan, the Wastewater Management Plan, Hazardous Materials Emergency Response Plan, Solid Waste Management Plan, and other associated waste minimization directives and plans, forms the basis for reducing pollution at Vandenberg AFB. The PPMP is applicable to all entities including military units, DOD and non-DOD agencies, government and non-government contractors, and commercial operators conducting activities on Vandenberg AFB and its remote sites that generate air emissions, hazardous and solid wastes and wastewater.

Potential impacts on P2 resulting from the Proposed Action would affect primarily Santa Barbara County, California. The region of influence considered in this EA for pollution prevention is Santa Barbara County.

The P2 Program addresses waste generation, material acquisition, handling and use of materials, production and operational activities, process management, waste management, and waste disposal. It is a cradle-to-grave approach, wherein there is an accounting of what enters, what is used, and what leaves Vandenberg AFB.

The Air Force has established specific minimization/reduction goals for selected P2 Program components:

- Ozone depleting chemicals (ODCs);
- EPA 17 industrial toxic project chemicals;
- Hazardous waste;
- Municipal solid waste;
- Environmentally preferred products;
- Energy conservation;
- Water conservation;
- Emergency Planning and Community Right-to-Know Act (EPCRA)/Toxic Release Inventory chemical releases; and
- Pesticide management.

3.7 Land Use and Aesthetics

This section addresses the setting, existing land uses, and aesthetics of the project areas for the Proposed Action and Alternative C, and adjacent areas. The surrounding land uses are not anticipated to change with implementation of either the Proposed Action or Alternative C.

3.7.1 Setting

Vandenberg AFB comprises a total of 99,099 acres in northern Santa Barbara County. The Base is divided into two areas, known as North Vandenberg AFB and South Vandenberg AFB, by SR 246 (West Ocean Avenue at this juncture). North Vandenberg AFB contains the urbanized cantonment area, which includes administrative, industrial, and residential uses. Scattered launch, test, and tracking facilities occur on both North and South Vandenberg AFB.

Open space accounts for over 90% (over 89,543 acres) of the land. The area covered by buildings, helipads, runways, driveways, roads, recreation areas, and slabs, totals 33,180 acres (approximately 33%). The majority of these developed lands are within the cantonment area of North Vandenberg AFB.

Development on Vandenberg AFB is regulated through the Vandenberg AFB

General Plan (USAF 2004), various U.S. Air Force safety regulations, and several state and Federal regulations aimed at preserving the cultural and environmental resources on Vandenberg AFB (see Table 1-1, Chapter 1). Guidance for land use planning is in AFI 32-7062, Air Force Base Comprehensive Planning (26 February 2002).

Visual resources and landscape elements on Vandenberg AFB include natural features such as gently rolling hills, canyons, creeks, sand dunes and beaches. Man-made features on base include the airfield, launch pads, residential development, industrial facilities, and other structures typical of a military installation. Visual resource sensitivity is dependent on the type of user, the amount of use, and viewer expectations. Because the mission of the base is the development of U.S. space and missile programs, viewers are familiar with the existing man-made features on the base associated with these programs.

The area where the proposed WR CT Site would be located is situated on a very gently sloping parcel in an open space region of North Vandenberg AFB, approximately two miles northeast of the airfield runway. To the north of the site there is a paved road (Watt Road), an unpaved road (Atlas Road), and an abandoned-in-place launch site (ABRES) with associated facilities. 13th Street runs along the eastern side of the site, and various mission related buildings are present along 13th Street north and south of the site. Specifically, the WR CT Site would be located on an undeveloped parcel vegetated by a highly disturbed coastal scrub that in the past has been subjected to various disturbances including the installation of power lines and prescribed burns.

3.7.2 Coastal Zone Management

Federal activity in, or affecting, a coastal zone requires preparation of a Coastal Zone Consistency Determination or a Negative Determination, in accordance with the federal Coastal Zone Management Act (CZMA) of 1972. The California Coastal Zone Management Program was formed through the California Coastal Act (CCA) of 1972. The Air Force is responsible for making final coastal zone consistency determinations for its activities within the state. The California Coastal Commission reviews federally authorized projects for consistency with the California Coastal Zone Management Program.

On Vandenberg AFB, the coastal zone extends inland from approximately 0.75 mile at the northern boundary to 4.5 miles at the southern end of the base. The Proposed Action and Alternative C are located approximately 2.5 miles inland and are within the coastal zone.

3.8 Utilities

Several regulations apply to energy efficiency and conservation. The Energy Policy Act of 1992 requires that federal agencies significantly reduce their use of energy and reduce environmental impacts by promoting the use of energy-efficient and renewable energy technologies. EO 12902, Energy Efficiency and Water Conservation at Federal Facilities, requires agencies to develop an implement programs to reduce energy consumption by 30% by the year 2005.

3.8.1 Electrical System

Pacific Gas and Electric Company (PGE) provides electricity to Vandenberg AFB via the Orcutt Substation. Three metered electrical services distribute the electricity throughout the base: Honda Canyon, Oak Mountain, and Main Base. Electrical power consumption in 1997 at Vandenberg AFB was 182,497,304 kW-hours (USAF 2004). Electrical lines in the vicinity of the Proposed Action Area and Alternative C Area are aboveground and mounted on poles. Vandenberg AFB military and civilian personnel do maintenance of the Vandenberg AFB electrical system.

3.8.2 Water System

The water distribution system at Vandenberg AFB serves the base and the Lompoc Federal Penitentiary. Until 1997, the potable water supply was obtained from groundwater aquifers. Water usage surveys completed in 1996 indicated that groundwater consumption exceeded the replenishment rate. Vandenberg AFB average daily water use in 1997, including the Federal Penitentiary usage, was estimated at 3.6 million gallons per day (mgd), equivalent to 4,032 acre-feet per year. In October 1997, Vandenberg AFB entered into a contract with the State of California and the Central Coast Water Authority (CCWA) to purchase 5,500 acre-feet per year of state water. The point of delivery is at the Vandenberg AFB Main Reservoir, on North Vandenberg AFB. (USAF 2004).

3.9 Human Health and Safety

All construction activities and facility operations and maintenance on Vandenberg AFB are subject to the requirements of the federal Occupational Health and Safety Act (OSHA), and Air Force Occupational Safety and Health (AFOSH) regulations.

Relevant health and safety requirements include industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of 30 SW Safety, Bioenvironmental Engineering, 30 SW Safety, and contractor safety departments. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations. Ground safety is the responsibility of 30 SW Safety and includes protection from hazardous situations and hazardous materials.

Many areas on Vandenberg AFB were used as ordnance training ranges in the past. As a result, there are remnants of unexploded ordnance (UXO) in recognized areas of the base. Only a slight movement may detonate UXO from these areas, resulting in an explosion, burning, or release of smoke. Special precautions need to be taken in known areas of Vandenberg AFB that were used as practice ranges for artillery firing, referred to as Explosive Ordnance Disposal (EOD) Zones.

The affected environment for Health and Safety is the regulatory environment for health and safety issues established to minimize or eliminate potential risk to the general public and personnel involved in the WR CT Site construction project.

Noise

The Noise Control Act (42 USC 4901 *et seq.*) sought to limit the exposure and disturbance that individuals and communities experience from noise. It focuses on surface transportation and construction sources, particularly near airport environments. The NCA also specifies that performance standards for transportation equipment be established with the assistance of the Department of Transportation. Section 7 of the NCA regulates sonic booms and gave the Federal Aviation Administration regulatory authority after consultation with the U. S. EPA. In addition, the 1987 Quiet Community amendment gave state and local authorities greater involvement in controlling noise.

Noise is often defined as unwanted sound that can interfere with normal activities or otherwise diminish the quality of the environment. Depending on the noise level, it has the potential to disrupt sleep, interfere with speech communication, or cause temporary or permanent changes in hearing sensitivity in humans and wildlife. Noise sources can be continuous (e.g., constant noise from traffic or air conditioning units) or transient (e.g., a jet overflight or an explosion) in nature. Noise sources also have a broad range of frequency content (pitch) and can be nondescript, such as noise from traffic or be specific and readily definable such as a whistle or a horn. The way the acoustic

environment is perceived by a receptor (animal or person) is dependent on the hearing capabilities of the receptor at the frequency of the noise, and their perception of the noise. (URS 1986)

The amplitude of sound is described in a unit called the decibel (dB). Because the human ear covers a broad range of encountered sound pressures, decibels are measured on a quasi-logarithmic scale,. The dB scale simplifies this range of sound pressures to a scale of 0 to 140dB and allows the measurement of sound to be more easily understood.

There are many methods for quantifying noise, depending on the potential impacts in question and on the type of noise. One useful noise measurement in determining the effects of noise is the one-hour average sound level, abbreviated L_{eq1H}. The L_{eq1H} can be thought of in terms of *equivalent* sound; that is, if a L_{eq1H} is 45.3dB, this is what would be measured if a sound measurement device were placed in a sound field of 45.3dB for one hour. The L_{eq1H} is usually A-weighted unless specified otherwise. A-weighting is a standard filter used in acoustics that approximates human hearing and in some cases is the most appropriate weighting filter when investigating the impacts of noise on wildlife as well as humans. Examples of A-weighted noise levels for various common noise sources are shown in Table 3-9.

Existing noise levels on Vandenberg AFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near industrial facilities and transportation routes. Rocket launches and aircraft over flights create louder intermittent noise levels. On Vandenberg AFB, general ambient L_{eq1H} measurements have been found to range from around 35 to 60dB (Thorson et al. 2001).

Construction activities associated with the proposed project would generate relatively continuous noise throughout the 10-month construction period. Details on exact construction equipment that would be used are listed in Chapter 2, Table 2-2.

Table 3-9.
Comparative A-Weighted sound levels.

Noise Level (dBA)	Common Noise Levels	
	Indoor	**Outdoor**
100 - 110	Rock band inside New York subway	Jet flyover at 304 meters
90 - 100	Food blender at one meter	Gas lawnmower at one meter
80 - 90	Garbage disposal at one meter	Diesel truck at 15 meters Noisy urban daytime
70 - 80	Shouting at one meter Vacuum cleaner at three meters	Gas lawnmower at 30 meters
60 - 70	Normal speech at one meter	Commercial area heavy traffic at 100 meters
50 - 60	Large business office Dishwasher next room	
40 - 50	Small theater (background) Large conference room (background)	Quiet urban nighttime
30 - 40	Library (background)	Quiet suburban nighttime
20 - 30	Bedroom at night	Quiet rural nighttime
10 - 20	Broadcast and recording studio (background)	
0 – 10	Threshold of hearing	

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Chapter 4. Environmental Consequences

This chapter presents the results of the analysis of potential environmental effects of implementing the Proposed Action and Alternatives as described in Chapter 2. For each environmental component, anticipated impacts are assessed considering short- and long-term effects.

4.1 Biological Resources

Federal agencies are required by Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq.*), to assess the effect of any project on federally listed threatened and endangered species. Under Section 7, consultation with the USFWS and the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is required for federal projects if such actions could directly or indirectly affect listed species or destroy or adversely modify critical habitat. It is also Air Force policy to consider listed and special status species recognized by state agencies when evaluating impacts of a project. Impacts to biological resources would occur if special status species (endangered, threatened, rare, or candidate) or their habitats as designated by federal and state agencies would be affected directly or indirectly by project-related activities. These impacts can be short- or long-term impacts, for example, short-term or temporary impacts from noise and dust during construction, and long-term impacts from the loss of vegetation and thereby loss of the capacity of habitats to support wildlife populations.

Different species are subject to different impacts and different sites support different species densities due to spatial variation in the number and type of habitats, the presence or absence of unique habitat features such as streams or vernal wetlands, and the degree of human-induced disturbance.

Potential impacts to biological resources include:

- short-term (temporary) and long-term (permanent) loss of habitat from construction related activities such as access, excavation and construction;
- loss of individuals within the work area due to excavation, crushing or burial;
- loss of individuals in habitats adjacent to work areas due to soil erosion.
- abandonment of breeding and/or roosting sites due to project related noise and associated disturbance; and
- disruption of foraging or roosting activities due to project related noise and associated disturbance.

Adverse effects resulting from the construction of the proposed WR CT Site on Vandenberg AFB are expected to include temporary, short-term effects as well as permanent, long-term effects. Construction constraints and monitoring measures, as described in Section 2.1.9.1, will prevent or minimize these adverse impacts to native plant communities and special status plant and wildlife species.

Potential project impacts specific to habitats and species are discussed in further detail in the sections that follow.

4.1.1 Alternative A: Proposed Action

Under the Proposed Action approximately 41 acres have the potential to be adversely affected. All vegetation within the

3-acre project area (area of direct disturbance) would be permanently removed, and vegetation within the APE, could also be affected by construction activities (see Figure 2-2 in Chapter 2).

4.1.1.1 Botanical Resources

Potential project related impacts to native plant communities, and special status plant species under the Proposed Action are summarized in Table 4-1.

Native Plant Communities

Approximately three acres of Central Coastal Scrub dominated by coyote brush and non-native perennial grasses (i.e., veldt grass) would be permanently removed as a result of grading and excavation. Approximately 38 acres have the potential to be adversely affected as a result of the installation of utilities and construction activities. The non-native veldt grass has extensively invaded the scrub community within the APE, reducing the biological diversity of this plant community and making this habitat less valuable for plant and wildlife species. Loss and disturbance of this scrub community, although an adverse impact, would not be considered significant given the low value of this habitat.

Special Status Plant Species

One federal and state endangered plant species and one plant species of concern and one federally and state endangered were documented within the APE.

The federally and state endangered Gaviota tarplant occurs in three locations of the ruderal community located along the road shoulders of 13th Street and Atlas Road. One individual was document within the APE for the proposed WR CT Site, along the road shoulder of 13th Street, approximately 1,500 feet south of the area of direct disturbance. Outside of the APE but in the vicinity of the project area, one individual was documented approximately 250 feet south of Atlas Road, and a small population was documented along Watt Road (see Figure 3-1). Because of the annual nature of this species, pre-construction surveys would be conducted immediately prior to the start of construction activities to document the presence of all individual plants and protective measures (i.e., isolation and flagging of individuals) would be implemented to avoid adverse effects to this species during construction activities. In the event that individuals are documented within the path of the proposed trenching for installation of the fiber optic lines, the trenching would be diverted to avoid adversely impacting the plants.

Table 4-1.
Potential Proposed Action project related impacts to native plant communities and special status plant species.

Community/Plant Species	Status*	Adverse Effects
Central Coastal Scrub		Permanent loss of three acres Potential disturbance to 38 acres
Deinandra increscens ssp. *villosa* Gaviota tarplant	FE/SE	Permanent loss of all individuals adjacent to the roadside without protective measures
Horkelia cuneata ssp. *sericea* Kellogg's horkelia	FSC	Permanent loss of individuals within the APE without protective measures

* FE – Federally Endangered FSC – Federal Species of Concern SE – State Endangered

Kellogg's horkelia is a federal species of concern and occurs throughout the southern 1,200-foot section of the APE (see Figure 3-1 in Chapter 3). Construction disturbance in this area of the APE would be restricted to the two 18-inch wide trenches required for installation of the fiber optic lines. It is anticipated that one trench would be dug along the western road shoulder of 13th Street with the second one placed between six and 20 feet to its west. To the extent possible, individuals of Kellogg's horkelia would be isolated and protected from adverse effects during construction activities.

4.1.1.2 Wildlife Species

The permanent removal of 3 acres of coastal scrub would be considered an adverse effect on wildlife habitat. However, given the low value of this habitat (as described above), and the availability of ample habitat in the surrounding area, this adverse impact would not be considered significant. In addition, construction activities also generate noise that could result in a potentially adverse short-term (temporary) impact on wildlife resources. The level of impact associated with construction noise is discussed in more detail below.

Construction Noise and Disturbances

Wildlife, including amphibians, reptiles, mammals, and birds, present in the area could be affected by construction noise.

Predictions of noise levels for the different construction activities for a stationary observer were developed for distances between 50 and 1,000 ft (Table 4-2). The equipment and machinery selected for each activity is typical for each type of construction activity. To place noise levels in perspective, a food blender at a distance of three feet generates 90 dB. Riding an automobile at 40 miles per hour produces approximately 75 dB. Normal speech is approximately 60 dB. On Vandenberg AFB, measurements have been found to range from 35 to 60 dB, with the higher level representative of areas with higher traffic (SRS Technologies 2001).

Table 4-2.
Noise levels as a result of construction activities associated with the Proposed Action.

Distance from construction area (Feet)	Maximum L_{eq1h}
50	88.2
100	83.7
300	76.6
500	73.2
1000	68.7

Short-term disturbance of noise-sensitive wildlife species near the construction site would potentially occur. Wildlife response to noise can be physiological or behavioral. Physiological responses can range from mild, such as an increase in heart rate, to more damaging effects on metabolism and hormone balance. Behavioral responses to man-made noise include attraction, tolerance, and aversion. Each has the potential for negative and positive effects, which vary among species and among individuals of a particular species due to temperament, sex, age, and prior experience with noise. Responses to noise are species-specific; therefore, it is not possible to make exact predictions about hearing thresholds of a particular species based on data from another species, even those with similar hearing patterns.

Herpetofauna

Reptile and amphibian species are likely to occur within the APE. Biological monitoring during site grading and removal of vegetation would provide the opportunity to relocate any individuals that are in the path of construction vehicles to suitable habitat adjacent to but outside the construction limits.

Reptile and amphibian hearing is poorly studied. However, reptiles and amphibians are sensitive to vibrations, which provide information about approaching predators and prey. Vibration and noise associated with construction activities would potentially cause short-term disturbance to amphibians and reptiles (e.g., California horned lizard). These impacts would be considered short-term and

would not be considered of a magnitude to result in adverse impacts to populations within the vicinity of the project area. Implementation of the monitoring measures described in Section 2.1.9.1 would prevent the occurrence of any adverse impacts.

Avian Species

Construction activities associated with the Proposed Action would occur over approximately 10 months, which would include the breeding season for many wildlife species including birds. The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703-712), provides federal protection to all native avian species, their nests, eggs, and unfledged young.

Construction activities associated with the Proposed Action would result in noise disturbances, which may temporarily disrupt foraging and roosting activities of individual birds within the APE and adjacent areas. Birds would be expected to move away from the area of disturbance during construction activities. However, once activity ceases, birds would be likely to return to the area.

During the breeding season for avian species, construction has the potential to disrupt breeding activities including courtship, incubation and brooding. These impacts would be considered short-term and would not be considered of a magnitude to result in adverse impacts to populations within the vicinity of the project area.

The clearing of vegetation within the area of direct disturbance would result in the removal of existing breeding and roosting habitat for avian species. However, the abundance of suitable habitat in the vicinity would compensate for lost roosting and breeding habitats.

If feasible, clearing of vegetation within the area of direct disturbance would occur during the non-breeding season (September through February) to avoid adverse impacts on breeding avian species. In the event clearing of vegetation within the area of direct disturbance occurs during the breeding season (March through August), surveys would be conducted for breeding avian species immediately prior to the beginning of vegetation clearing. If any nests were found within the area of direct disturbance, no clearing of vegetation would occur until the eggs are hatched and the young fledged. If nests were found near to but outside the area of direct disturbance, they would be monitored for potential disturbance resulting from noise.

To avoid potential adverse effects to migrating/wintering Western burrowing owls within the project area, pre-construction surveys would be conducted immediately preceding construction activities regardless of the time of year of construction. If non-nesting burrowing owls are present, they would be located, flushed from burrows and a qualified biologist would close the burrows to avoid risk of owl crushing or burial during construction.

Mammals

Mammalian species are likely to occur within the APE. Most individuals are expected to leave the area as a result of noise and human activity. Biological monitoring during site grading and removal of vegetation would provide the opportunity to relocate any individuals that are in the path of construction vehicles to suitable habitat adjacent to but outside the construction limits.

Potential noise related impacts to mammalian species during construction activities would include disruption of normal activities due to noise and ground disturbances. These impacts would be considered short-term and would not be considered of a magnitude to result in adverse impacts to populations within the vicinity of the project area.

Implementation of the construction constraints and monitoring measures described in Section 2.1.9.1 would prevent the occurrence of any adverse impacts.

Operational Impacts

Following construction, potential adverse effects to wildlife species during operation of the facility include potential electrocution of raptors associated with power pole design, and potential collision of diurnal birds with antenna guy wires, and of night-migrating birds and bats with guy wires and omniantennas.

Electrocution of raptors associated with power lines is a well-recognized issue. To prevent risk of electrocution to large raptors, measures for raptor-safe power pole and power line construction are incorporated into the design of all new power pole and power line installations on Vandenberg AFB. Recommendations and guidelines are available at http://migratorybirds.fws.gov/issues/towers/comtow.html, and from the Avian Power Line Interaction Committee, Edison Electric Institute and Raptor Research Foundation publication *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996*. If installation of new power poles were required, the guidelines recommended above would be followed.

Likewise, any guy wires incorporated in the antenna installation will include daytime visual markers to prevent collisions with diurnally moving avian species. (For guidance on markers see *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*).

Implementation of the construction constraints and monitoring measures described in Section 2.1.9.1, would prevent the occurrence of any adverse impacts during construction and operation of the proposed WR CT Site.

Special Status Wildlife Species

No federal threatened or endangered wildlife species are known to occur within the APE. However, several other federal special status wildlife species occur within or near the APE. Potential project related impacts to these species are listed in Table 4-3. Construction activities have the potential to result in the take of some special status wildlife species from activities such as disturbance. Implementation of the construction constraints and monitoring measures described in Section 2.1.9.1 would prevent the occurrence of any adverse impacts.

The Proposed Action would not adversely modify designated or proposed critical habitat.

Avian Species

The removal of vegetation would result in the loss of existing breeding and roosting habitat for special status avian species. However, given the low quality of the habitat and the abundance of suitable habitat in the vicinity, this adverse impact would be less than significant.

The removal of vegetation within the area of direct disturbance during the non-breeding season for avian species (September through February) would prevent potential for adverse effects on these species. If not feasible, pre-construction surveys immediately preceding vegetation removal during the breeding season (March through August) would prevent adverse effects. Other potential adverse impacts of disturbance to breeding birds in the vicinity of but outside the APE include abandonment of breeding sites, egg breakage by "panicked" adults, physical damage to the eggs due to noise, heating and cooling from exposure during periods of nest abandonment, and increased vulnerability to predation. Increased levels of human activity and associated noise generated during the construction could potentially displace special status species from adjacent nesting habitat. The severity of the impact would depend in a large part on the timing of the activity relative disturbance occurs after nesting has already been initiated, construction-related noise could adversely impact reproductive success.

Some avian species, including ferruginous hawks, white-tailed kites, and Western burrowing owls, have the potential to occur within the project area during migration and wintering months. The presence of these

Table 4-3.
Potential impacts to federal special status wildlife species that occur or with potential to occur within the APE.

Scientific Name Common Name	Status[1]	Occurrence	Potential Impacts
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	FSC/CSC	Potential	Crushing during vegetation removal and grading, and disruption due to noise.
Phrynosoma coronatum frontale California horned lizard	FSC/CSC	Potential	Crushing during vegetation removal and grading, and disruption due to noise.
Birds			
Athene cunicularia hypugea Western burrowing owl	FSC/CSC	Potential	Disruption due to noise.
Aquila chrysaetos Golden eagle	FP/CSC	Potential	Disruption due to noise.
Buteo regalis Ferruginous hawk	FSC/CSC	Potential	Disruption due to noise.
Carduelis lawrencei Lawrence's goldfinch	FSC	Potential	Abandonment of breeding site and disruption due to noise.
Elanus leucurus White-tailed kite	FSC	Potential	Disruption due to noise.
Lanius ludovicianus Loggerhead shrike	FSC/CSC	Observed	Abandonment of breeding site and disruption due to noise.
Selasphorus sasin Allen's hummingbird	FSC	Potential	Abandonment of breeding site and disruption due to noise.
Toxostoma redivivum California thrasher	FSC	Potential	Abandonment of breeding site and disruption due to noise.

1 FSC – Federal Species of Concern FP – Federally Protected (Bald and Golden Eagle Protection Act of 1940)
CSC – California Species of Concern

species within the vicinity of the project area is likely to be short-term. Should any of these species occur during vegetation removal or construction activities, they would be subject to disturbance that could result in disruption of roosting and foraging activities. Given that disturbances to these species would be indirect and short-term, and that construction activities would be limited in area, with an abundance of suitable habitat in the vicinity, adverse impacts would be less than significant.

Waters of the United States and Wetlands

No wetlands were documented within the APE during the biological surveys. Construction activities associated with the new WR CT Site would not cross any waters of the United States.

4.1.2 Alternative B: No-Action Alternative

Under the No-Action Alternative the proposed WR CT Site would not be constructed, thus no disturbances to ground or vegetation would result. Under this alternative, no impacts to any habitat, plants or wildlife species would result.

4.1.3 Alternative C

Potential adverse impacts under this Alternative would be the same as for the Proposed Action, except that 44 acres (instead of 41) would have the potential to be affected (see Section 4.1.1). The same construction constraints and monitoring measures would apply (Section 2.1.9.1).

4.2 Cultural Resources

Effects to cultural resources would be considered adverse if they resulted in disturbance or loss of value or data that qualify a site for listing in the National Register of Historic Places (NRHP); if there was substantial disturbance or loss of data from newly discovered properties or features prior to their recordation, evaluation and possible treatment; or if the project substantially changed the natural environment or access to it such that the practice of traditional cultural or religious activities would be restricted. For known cultural resource sites, rerouting or redesigning to avoid impacts is typically the recommended option. If rerouting or redesigning is not possible, subsurface testing is usually recommended to determine the value of a site or data potentials relative to the NRHP, to assess possible adverse project effects, and to establish the physical relationship of site boundaries with the APE. In addition, 30 CES/CEVPC requires archaeological and Native American monitoring during construction through or adjacent to any known site, regardless of a site's NRHP eligibility. Archaeological and Native American monitoring is also typically required in areas where buried sites are possible (Lebow and Moratto 2001).

4.2.1 Alternative A: Proposed Action

Archival research indicates that the Alternative A APE was previously surveyed for cultural resources and no archaeological sites are recorded within the APE. Eleven archaeological sites are recorded within 0.25 mile of the APE. The closest site is approximately 800 feet away.

The proposed project will comply with Section 106 of the NHPA and with AFI 32-7065. No impacts to known cultural resources are anticipated under this Alternative. In the event that previously undocumented cultural resources are discovered during construction activities, guidelines set forth in the Vandenberg AFB Integrated Cultural Resources Management Plan will be followed.

4.2.2 Alternative B: No-Action Alternative

Under the No-Action Alternative the proposed WR CT Site would not be constructed. Thus no impacts to cultural resources would occur.

4.2.3 Alternative C

As with the Proposed Action, no archaeological sites are recorded within the APE. Thus, no adverse impacts to known cultural resources are anticipated. Under Alternative C, the same guidelines as described under the Proposed Action (Section 4.2.1) would apply.

4.3 Air Quality

The criteria for determining the significance of air quality impacts are based upon federal, state, and Santa Barbara County rules and regulations. Impacts would be considered to be significant if project emissions increase ambient pollutant concentrations from below the NAAQS or CAAQS to above these standards, or if they contribute measurably to an existing or projected ambient air quality standard violation. For all the actions evaluated, the construction actions are performed prior to the operational actions, therefore, separate calculations for construction and operational emissions are evaluated for air conformity analysis.

4.3.1 Alternative A: Proposed Action

The U.S. Air Force is required to make a formal conformity analysis to determine whether the Proposed Action complies with the conformity rule found in the Clean Air Act;

as such, an Air Quality Analysis (Appendix D) was completed for the Proposed Action. The results of this analysis deemed the Proposed Action *de minimis* and not regionally significant and, therefore, would be exempt from further conformity requirements. This determination is in accordance with conformity requirements set forth in 40 CFR 93.153 (b) and (c), *Determining Conformity of Federal Actions to State or Federal Implementation Plans, Applicability*, and the Clean Air Act 1990 Amendments, Title I, *Air Pollution Prevention and Control*, Subpart 2, Part D, *Plan Requirements for Nonattainment Areas*, Section 176, *Limitations On Certain Federal Assistance*, (c)(4).

4.3.1.1 Construction

Estimates for construction equipment specifications are presented in Appendix D, *Air Quality Analysis*, Table D-1, while the factors used to estimate emissions are found in Table D-2. For purposes of this analysis, it is estimated that an average of 0.83 acres per day would be disturbed from the trenching and boring activities and other equipment operating on exposed ground. It is further estimated that in a reasonable worst-case day, wherein more equipment than expected would be in operation, 8.27 acres would be disturbed from the trenching and other equipment operating on exposed ground. With construction lasting 8-hours per day and five days per week, the reasonable worst-case day for fugitive dust emissions, including implementing the control measures listed below under *Emission Minimization Measures*, during the Proposed Action would be 23 pounds of PM_{l0} per day. These emissions would not be expected to exceed any ambient air quality standard and, therefore, no adverse impacts from PM_{10} would occur.

The methodology and assumptions used to calculate emissions from the Proposed Action are presented in Appendix D, *Air Quality Analysis*. The daily and total emission from construction activities can be found in Tables D-3 and D-4, respectively.

The *daily* emissions from the Proposed Action are estimated to be as follows: 44 pounds of CO, 117 pounds of NO_x, 30 pounds of PM_{10}, 11 pounds of ROC, and 2 pounds of SO_x. The *total* project emissions from the Proposed Action are estimated to be as follows: 1.26 tons of CO, 3.08 tons of NO_x, 0.95 tons of PM_{10}, 0.29 tons of ROC, and 0.06 tons SO_x.

Based on the distribution of construction emissions throughout the proposed construction schedule, emissions from this short-term construction project would not be expected to exceed the SBCAPCD significant threshold levels of 25 tons per year. Since no ambient air quality standards would be exceeded, the impacts from construction activities associated with the Proposed Action would not be considered to be significant to the region's air quality.

4.3.1.2 Operations

Current operations support 16 launches per year that would require four personnel per launch for two full days (three shifts). Current back-up diesel generator (500-Hp) operates an average of 45 hours per year.

The proposed WR CT facility would replace current operational activities; however, there are two differences in the new facility operational activities: (1) Personnel would have an eight-mile roundtrip reduction in distance for travel to the new facility; and (2) There would be two 750-Hp back-up generator diesel internal combustion engines (instead of one 500-Hp). The proposed back-up generators will comply with the Stationary Diesel Airborne Toxic Control Measures (ATCM) standards and these emission factors are included in Appendix D, Table D-6.

The operational activities emissions factors, and total operational emissions are included in Appendix D, Tables D-5, D-6, and D-7, respectively.

The annual total operational emissions from the Proposed Action are estimated as follows: 0.30 tons of CO, 0.30 tons of NO_x,

0.01 tons of PM_{10}, 0.03 tons of ROC, and 0.01 tons of SO_x.

Based on the distribution of operational emissions from previous averages, the operational emissions from this project would not be expected to exceed the SBCAPCD significant threshold levels of 25 tons per year. Since no ambient air quality standards would be exceeded, the operational impacts from the Proposed Action would not be considered to be significant to the region's air quality.

Proposed New SBCAPCD Rule Adoption Impacts

The SBCAPCD is proposing rule changes that would affect the type and operational requirements, including potential new permits and potential new source reviews, for internal combustion engines, generators, and overall air quality equipment operations at Vandenberg AFB. The proponent should contact 30 CES/CEV, Environmental Management Office, prior to purchasing, testing, installing air quality equipment, or obtaining a new air quality permit for any activities on Vandenberg AFB to ensure the best compliance operations under the Vandenberg AFB air quality program.

Emission Minimization Measures

The following SBCAPCD dust control measures would be required to further decrease fugitive dust emissions from ground disturbing activities:

- Apply water, preferably reclaimed, at least twice daily to dirt roads, graded areas, and exposed dirt stockpiles to prevent excessive dust at the staging areas. Chlorinated water would not be allowed to run into any waterway.
- Minimize vehicle speeds on exposed earth.
- After completion of construction activities, treat disturbed soil by watering, revegetating, or spreading soil binders to prevent wind erosion of the soil.
- Limit ground disturbance to the smallest, practical area and to the least amount of time.
- Designate personnel to monitor construction to ensure that excessive dust is not generated at construction sites.
- Comply with the SWPPP, including best management practices to reduce dust emissions. The contractor's Environmental Protection Plan should include dust control compliance measures.
- The contractor will implement practices to reduce engine run and idle times.

4.3.2 Alternative B: No-Action Alternative

Under the No-Action Alternative, there would be no construction associated with a new WR CT Site. Therefore, no impacts to air quality would occur as a result of new construction activities.

4.3.3 Alternative C

The total project area for Alternative C would be the same as the Proposed Action, but located 1,500 feet south of Watt Road. Under this Alternative, the fiber optic line would be 240 feet longer and the power line would be 265 feet shorter than under the Proposed Action. Operational aspects under this alternative would be the same as those described under the Proposed Action. Although construction air emissions would differ from those estimated under the Proposed Action, these differences would be insignificant when considering the entire project. Therefore, potential adverse impacts associated with this Alternative would be of the same magnitude as those of the Proposed Action (Section 4.3.1).

4.4 Water Resources

Adverse impacts to water resources would occur if the Proposed Action 1) caused

substantial flooding or erosion, 2) adversely affected surface water, or 3) adversely affected groundwater quantity or quality.

In California, the state Water Resources Control Board and the RWQCB administer the Clean Water Act (CWA) and state water regulations. The Central Coast RWQCB is the local agency responsible for the Vandenberg AFB area. The CWA defines the standards for water quality and mandates that treated water discharged to surface water or to the ocean is subject to the requirements of a NPDES Permit, which ensures that the water discharged meets water quality standards at the point of discharge. The RWQCB is responsible for management of the NPDES Permit process for California.

4.4.1 Alternative A: Proposed Action

Under the Proposed Action, construction activities have the potential to disturb up to 41 acres of land, with a minimum of three acres of disturbance. Because construction activities would disturb a land area greater than one acre, a NOI to comply with the state NPDES General Permit is required to protect water resources. The NPDES Permit requires a SWPPP that identifies sources of sediment and other pollutants in order to 1) reduce or eliminate storm water and non-storm water discharges associated with construction activities, and 2) minimize impacts to water resources by ensuring water discharged from the construction site meets water quality standards at the point of discharge. All NPDES permit requirements would be implemented to minimize potential for adverse effects to water quality. Unless otherwise directed by the 30 CES/CEV Compliance Office, the primary construction contractor is usually responsible for submittal of the NOI.

Construction activities would include the use of hazardous materials that could result in an adverse impact to water resources if not properly controlled and managed. Project activities are not expected to adversely affect the water quality of San Antonio Creek due to the distance between the project area for the proposed WR CT Site and this waterway. Nevertheless, proper storage, secondary containment, and spill prevention measures would be implemented for the duration of construction activities to prevent the accidental introduction of any hazardous waste into the environment.

Implementation of the protection measures outlined in Section 2.1.9.4 would reduce potential adverse impacts to less-than-significant.

4.4.2 Alternative B: No-Action Alternative

Under this Alternative, the proposed WR CT Site would not be constructed. As a result, water resources would not be adversely affected.

4.4.3 Alternative C

Under this Alternative, construction activities could disturb up to 44 acres, with a minimal disturbance of three acres. Potential adverse impacts to water resources would be of the same magnitude and effect as those of the Proposed Action (Section 4.4.1).

4.5 Earth Resources

Factors considered during evaluation of the environmental consequences of the Proposed Action and Alternatives on earth resources include seismicity, structural damage, surface fault ruptures, and liquefaction.

4.5.1 Alternative A: Proposed Action

Construction activities associated with the proposed WR CT Site would not include extensive excavation or intrusive activities such as blasting. Therefore subsurface geology and soils would not be adversely affected. Surface fault ruptures during a seismic event are not expected to have a

direct effect on the proposed WR CT Site because no faults transverse the project site.

Construction of the proposed WR CT Site would require the removal of vegetation and disturbance of soil during grading, road construction, and installation of foundations and underground utilities. These activities typically loosen the soil and tend to promote erosion during periods of wind or rainfall. Because soils in the vicinity of the project area are subject to high wind erosion, appropriate sediment and soil control techniques would be used to minimize soil loss. Best Management Practices (BMPs) would be followed, including the use of sediment basins, sediment fences, mulch, and water spraying during dry periods. A Soil Erosion and Sediment Control Plan and a SWPPP would be developed by the contractor and implemented in accordance with applicable local, state, and Air Force guidelines to minimize storm water runoff and erosion. Landslides, which are most common in steep-sloped areas, are not likely to occur within the project site because of its gently sloping terrain (see Figure 3-3 in Chapter 3 of this EA).

Implementation of the protection measures outlined in Section 2.1.9.4 would reduce potential adverse impacts to less-than-significant.

4.5.2 Alternative B: No-Action Alternative

Under this Alternative, the proposed WR CT Site would not be constructed. Thus, earth resources would not be affected.

4.5.3 Alternative C

Potential adverse impacts associated with this Alternative would be of the same magnitude and effect as those of the Proposed Action (Section 4.5.1).

4.6 Hazardous Materials and Waste Management

4.6.1 Alternative A: Proposed Action

Hazardous Materials

Hazardous materials primarily in the form of petroleum, oil and lubricants (POL) will be used for construction equipment. Hazardous materials will be properly stored and managed in secured areas. Standard procedures ensuring that all equipment is maintained properly and free of leaks during operation, and all necessary repairs are carried out with proper spill containment, should minimize the risk of accidental spillage. The use of standard spill prevention procedures should ensure that no adverse impacts occur on the environment. Strict compliance with all applicable regulations, as described in Section 2.1.9.6 would avert the potential for adverse impacts as a result of the presence and use of hazardous materials at the Proposed Action.

Solid Waste

All soil excavated during construction activities would be used as backfill, and any excess materials would be spread throughout the site.

Solid waste generated during the construction project would include packaging from materials (cardboard and plastic), scrap rebar, wood, pipes, and wiring, and miscellaneous waste generated by onsite construction workers. Contractors would be responsible for the disposal and/or recycling of all waste generated during the scope of the project.

Construction debris, along with green waste, used tires and other recyclable materials, will be segregated and diverted for reclamation. All green waste would be disposed of at the Vandenberg AFB Landfill. Any wastes resulting from the implementation of the Action that are not authorized to be disposed of in the Vandenberg AFB landfill

will be segregated and taken off base for recycling or disposal.

The addition of the proposed WR CT Site would result in a very small increase in the amount of solid waste generated by Vandenberg AFB. The amount of solid waste generated would not affect the daily maximum waste that the Vandenberg AFB landfill can accept.

The Proposed Action would have no adverse impacts on the environment.

Pollution Prevention

Construction operations associated with the Proposed Action would create pollution in the air and water and would generate hazardous and solid waste. Compliance with the Vandenberg AFB PPMP and implementation of the recommended measures for air quality (Section 4.3), and hazardous waste and solid waste management (see above) would enhance pollution prevention.

Contractors on Vandenberg AFB must comply with affirmative procurement requirements as specified in federal and Air Force policies, regulations and plans, including Section 6002, Federal Procurement, of the Resource Conservation and Recovery Act (RCRA); EO 12873, Federal Acquisition, Recycling, Waste Prevention; EO 13149, Greening the Government; EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition; AFI 32-7080, Compliance Assurance and Pollution Prevention; 30 SW Plan 32-7042, Solid Waste Management Plan; and 30 SW Plan 32-7080, Pollution Prevention Management Plan.

The contractor shall use specified materials with recycled and recovered content as the minimum standard, which shall be considered when evaluating recycled or reused materials as part of the contractor's affirmative procurement program. The contractor shall also consider other green materials and products not listed, but commonly used in industry outside of the Government as a means of further reducing hazardous materials, hazardous waste and solid waste. The contractor shall make sure these materials and products meet the requirements of any of their contract specifications.

In addition, EO 13101 requires the use of products which have reduced toxicity and hazardous characteristics or reduced embodied energy in its manufacturing. The U.S. EPA provides comprehensive on-line training in the World Wide Web site www.epa.gov/opptintr/epp/toolspage.htm.

Compliance with the guidelines and measures described above would result in no adverse impacts to the environment.

4.6.2 Alternative B: No-Action Alternative

Under this Alternative, the proposed WR CT Site would not be constructed. Thus, no adverse impacts from hazardous materials and waste would occur.

4.6.3 Alternative C

Potential adverse impacts associated with this Alternative would be of the same magnitude and effect as those of the Proposed Action (Section 4.6.1).

4.7 Land Use and Aesthetics

Factors considered in the evaluation of the environmental consequences of implementing the Proposed Action, Alternative C, and the No-Action Alternative for land use include:

- restriction to development of facilities on Vandenberg AFB;
- public accessibility to and interactions with recreational areas in the vicinity of the project area and Vandenberg AFB; and
- the potential for a decrease in available agricultural lands near the project area.

- Aesthetic values as described under the CZMA and the CCA.

4.7.1 Alternative A: Proposed Action

Setting

Construction of the WR CT Site under the Proposed Action would not result in a conversion of prime agricultural land or cause a decrease in the utilization of land. In addition, the proposed WR CT Site is not expected to adversely affect recreation or aesthetics.

The Proposed Action would occupy land presently designated as open space under the Vandenberg AFB General Plan (USAF 2004). Adverse impacts to land use would be negligible because the acreage that would be removed from open space represents less than 0.01% of open space on the Base (Table 4-4).

Construction of the proposed WR CT Site would not result in restrictions to development of facilities or activities associated with Vandenberg AFB mission.

Construction of the proposed WR CT Site under this Alternative would result in the removal of approximately three acres of vegetation and its replacement with various structures. However, because the affected area is small in size, and degraded as a result of past disturbances, this loss of open space would not be considered a significant adverse effect.

Coastal Zone Management

The CZMA and CCA mandate that the scenic and visual qualities of coastal areas be considered and protected as a resource of public importance. The site for the proposed WR CT facility although located within the California Coastal Zone is not situated along the ocean or other scenic coastal area. No adverse impacts to the coastal zone, as defined by the CZMA and CCA, are anticipated as a result of construction of the proposed WR CT Site. Coordination with the California Coastal Commission is required for development within the coastal zone. Vandenberg AFB will address the Proposed Action with Commission staff and request California Coastal Commission concurrence with a Negative Determination.

4.7.2 Alternative B: No-Action Alternative

Under this Alternative, the proposed WR CT Site would not be constructed. Thus, no adverse impacts to land use and aesthetics would occur.

Table 4-4.
Distribution of Land Use on Vandenberg AFB.

Land Use	Area (acres)	Percent
Administrative	71	0.07
Air Education Training Command	80	0.08
Airfield	870	0.88
Community	88	0.09
Housing	637	0.70
Industrial	5,510	5.60
Launch Operations	2,198	2.23
Medical	16	0.02
Open Space	88,260	89.65
Outdoor Recreation	666	0.68
Bodies of Water	49	0.05

Source: Vandenberg AFB 2004.
Note: Percentages do not total 100 percent due to rounding.

4.7.3 Alternative C

As with the Proposed Action (section 4.7.2), no adverse impacts would result from this Alternative. California Coastal Commission concurrence with a Negative Determination would also be required under Alternative C.

4.8 Utilities

4.8.1 Alternative A: Proposed Action

Although unlikely, temporary accidental disruption of electrical service could occur during construction. However, these power outages would affect Vandenberg AFB users only. A negligible increase in electrical usage is expected as a result of the operation of the proposed WR CT Site.

Temporary disruptions in water service may occur as underground pipes are rerouted or installed to supply water to the proposed WR CT Site. Potential accidents during construction activities could result in the temporary disruption of water to Vandenberg AFB users. Tanker trucks would provide water for construction purposes; therefore, no increase in water usage resulting from construction activities is expected to occur. Water usage rates after completion of construction are not expected to significantly increase given the magnitude of the proposed project.

A negligible increase in wastewater generated by the construction crews is expected. All wastewater generated would be transported to the Lompoc Regional Wastewater Treatment Plant. Once construction is completed, a septic waste system will service the facility and wastewater will not be generated.

Based on the estimated short-term and limited changes in utilities consumption, no adverse environmental impacts would result from the construction and operation of the facility.

Based on the estimated short-term and limited changes in utilities consumption, no adverse environmental impacts would result from the Proposed Action.

4.8.2 Alternative B: No-Action Alternative

Under this Alternative, the proposed WR CT Site would not be constructed. Thus, there would be no effects on utilities.

4.8.3 Alternative C

As with the Proposed Action (Section 4.8.1), no adverse impacts would result from this Alternative.

4.9 Human Health and Safety

4.9.1 Alternative A: Proposed Action

To provide for the health and safety of workers, subcontractors, and visitors during construction operations associated with the Proposed Action, the construction contractor would comply with AFOSH and Federal-OSHA regulations. Compliance with these regulations should avoid general construction hazards that could adversely impact human health and safety and ensure no significant adverse environmental impacts result from implementation of the Proposed Action.

Prior to the start of construction activities, the site would be inspected and cleared of UXO.

Hazardous Materials and Wastes

Hazardous materials, primarily in the form of POLs would be used for operating the construction equipment. The potential exists for unexpected releases of POLs. Strict compliance with OSHA and AFOSH

regulations would avert the potential for adverse impacts to human health and safety.

Radio Frequency Hazards

During operation of the proposed WR CT Site, four VUS directional antennas will be active during launches. Each antenna will be active for approximately eight hours, with an additional six hours for extended operations. Presently, there are 18 launches scheduled for 2005. Antennas can also be activated for maintenance, training and other support operations, and dummy loads. Radio frequency (RF) radiation emanating from the antennas is recognized as having adverse effects on human health and safety, Electro Explosive Devises (EED), and Electro Magnetic Interference (EMI) for aircraft activity. Table 4-5 lists distances to avoid adverse RF radiation.

Table 4-5.
Safe distances for directional antennas.

Hazard	Meters	Feet
Personnel	42.20	138.50
Exposed EED's	493.32	1618.52
EMI for Aircraft	40.98	134.45

The antenna control design will be oriented such that the main beams will be pointing southwest, towards open space. RF radiation hazards could potentially result in adverse impacts if personnel were directly exposed to RF radiation. The closest roadway where personnel could be present during activation of the antennas is approximately 4,500 feet southwest, at Cross Road. Given the distance, no adverse impacts to human health and safety would occur.

The closest point from the directional antennas to the Airfield is approximately 7,850 feet. Based on calculations for antennas operating at the proposed WR CT Site, the airfield will not be adversely impacted from RF radiation.

Noise

According to regulations of the federal OSHA, employees should not be subjected to sound exceeding an average sound level (L_{eq}) of 90dB for an 8-hour period. This sound level increases by five dB with each halving of time (e.g., four hour period at 95dB). Exposure up to an L_{eq} of 115dB is permitted for a maximum of only 15 minutes during an 8-hour workday and no exposure above 115dB is permitted. For this analysis, OSHA standards are used as the "not to exceed" criteria as they are the most appropriate standards available. Furthermore, for this document "employees" would refer instead to personnel working on or visiting Vandenberg AFB that are not associated with the construction activities.

Predictions of noise levels for the different construction activities for a stationary observer were developed for distances of 50, 100, 300, 500 and 1000 feet (Table 4-6). The equipment and machinery selected for each activity is typical for each type of construction activity.

Table 4-6.
L_{eq1h} noise levels as a result of construction activities.

Distance from construction area (Feet)	Maximum L_{eq1h}
50	88.2
100	83.7
300	76.6
500	73.2
1000	68.7

As a sound source gets further away, the sound level decreases. This is called the attenuation rate. The rate used in these estimates was a decrease in level of 4.5dB per doubling of distance. This average rate has been shown to be an accurate estimate from field data on grassy surfaces (Harris 1998).

The Proposed Action would temporarily increase the ambient noise levels within the

project area and in neighboring areas. Based on the size of the construction activities, recommended noise levels of OSHA, and the anticipated exposure time to the construction noise, it is anticipated that adverse impacts would be minimal or non-existent and below the level of significance.

Other Potential Hazards

Potential physical hazards, including holes or ditches, uneven terrain, sharp or protruding objects, and slippery soils or mud, and biological hazards, including vegetation (i.e. poison oak and stinging nettle), animals (i.e. insects, spiders, and snakes), and disease vectors (i.e. ticks, rodents), have the potential to adversely impact the health and safety of construction personnel. Awareness training would reduce the likelihood that these hazards would interfere with construction personnel, and prevent adverse impacts from occurring.

4.9.2 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction would not occur and there would be no health and safety impacts resulting from construction or operation activities.

4.9.3 Alternative C

As with the Proposed Action (Section 4.9.1), no adverse impacts are anticipated with this Alternative.

4.10 Cumulative Impacts

Cumulative impacts result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions in the vicinity of the proposed project, regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The construction period for the Proposed Action is anticipated to last approximately 10 months. Projects completed in the vicinity of the Proposed Action within the past five years include a full replacement of the El Rancho Road Bridge over San Antonio Creek, the installation of fiber optic lines along Cross Road and El Rancho Road, and construction activities associated with facility refurbishments at Building 1768. One potential project has been identified that would occur in the vicinity of the Proposed Action site within the next five years.

The El Rancho Road Bridge project occurred approximately 0.75 miles to the northeast of the proposed WR CT Site location. Impacts associated with the El Rancho Road Bridge project affected biological resources within the riparian area and associated wetlands of San Antonio Creek in the vicinity of the project, and cultural resources near the project site. The proposed WR CT Site is a small magnitude project that is not anticipated to result in adverse impacts on resources analyzed with implementation of the recommended construction constraints and monitoring measures (Section 2.1.4). Because of its small magnitude and lack of adverse impacts, no adverse cumulative impacts are expected as a result of this project when considered in conjunction with the El Rancho Road Bridge project.

The installation of the fiber optic lines in the vicinity of the Proposed Action occurred at it nearest point at a distance of approximately 6,000 feet (1.1 miles), at the junction of Cross Road and El Rancho Road. These fiber optic lines were installed along the road shoulders with only minor adverse effects resulting to the ruderal vegetation occupying these areas. The federally endangered Gaviota tarplant was located within the action area for this project. However, construction constraints avoided any adverse effects on individuals of this species, thus no adverse effects resulted. The Proposed Action also provides for construction constraints to avoid adverse

effects on this species. Thus, no adverse cumulative impacts are expected to occur.

Building 1768 is approximately 7,000 feet (1.3 miles) south of the Proposed Action site. Construction activities associated with the renovation of this facility resulted in the removal of approximately 0.7 acres of Burton Mesa chaparral. No coastal scrub was affected by this project. The Proposed Action would result in the removal of approximately three acres of low quality coastal scrub. Because the removal of this scrub would be considered a minor adverse effect and the Proposed Action would not affect Burton Mesa Chaparral, no cumulative effects would result from the Proposed Action when considered in conjunction with this other past project.

The demolition of existing structures at the ABRES launch complex, approximately 0.25 miles northwest of the proposed site, could occur within the next five years. This project would entail the demolition to ground level of unoccupied structures (i.e., gantry, launch control center, pump house and a launch pad). Natural plant communities would not be affected by this project because it would occur in an already developed site. Potential impacts resulting from the generation of solid waste and air emissions would be analyzed in environmental documentation as of yet not completed. However, because the solid waste and air emissions generated by the Proposed Action would be of almost negligible levels, cumulative impacts on the environment would not result when considering both actions together.

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Chapter 5. Agencies and Persons Contacted

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Chapter 8. Distribution List

California Coastal Commission, Federal Consistency Review, San Francisco, CA

California Native Plant Society, Los Osos, CA

California Regional Water Quality Control Board, Central Coast Region, San Luis Obispo, CA

Environmental Defense Center, Santa Barbara, CA

La Purisima Audubon Society, Lompoc, CA

Santa Barbara County Air Pollution Control District, Project Review, Santa Barbara, CA

Santa Barbara Museum of Natural History, Santa Barbara, CA

Santa Ynez Chumash Indian Reservation, Tribal Elders Council, Santa Ynez, CA

U.S. Fish and Wildlife Service, Ventura Field Office, Ventura, CA

University of California, Museum of Systematics & Ecology, Santa Barbara, CA

Lompoc Public Library, Lompoc, CA

Santa Barbara Public Library, Santa Barbara, CA

Santa Maria Public Library, Santa Maria, CA

University of California, Library, Santa Barbara, CA

Vandenberg AFB Library, Vandenberg AFB, CA

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APPENDIX A

BENTONITE
MATERIAL SAFETY DATA INFORMATION

FISHER SCIENTIFIC, CHEMICAL DI -- BENTONITE
==========
MSDS Safety Information
==========
FSC: 6850
NIIN: 00-263-8640
MSDS Date: 11/06/1991
MSDS Num: BMWRL
Product ID: BENTONITE
MFN: 01
Responsible Party
Cage: 1B464
Name: FISHER SCIENTIFIC, CHEMICAL DIV.
Address: 1 REAGENT LANE
City: FAIR LAWN NJ 07410
Info Phone Number: 201-796-7100
Emergency Phone Number: 201-796-7100 OR 201-796-7523
Review Ind: Y
Published: Y
==========
Contractor Summary
==========
Cage: 1B464
Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address: 1 REAGENT LANE
City: FAIRLAWN NJ 07410-2802
Phone: 201-796-7100
==========
Item Description Information
==========
Item Manager: S9G
Item Name: DESICCANT,ACTIVATED
Specification Number: MIL-D-3464E
Type/Grade/Class: TYPE I
Unit of Issue: CN
Quantitative Expression: 00000000005GL
UI Container Qty: 1
Type of Container: CAN/PAIL
==========
Ingredients
==========
Cas: 1302-78-9
RTECS #: CT9450000
Name: BENTONITE (AS NUISANCE DUST OR PARTICULATES NOT OTHERWISE REGULATED)
% Wt: 100
OSHA PEL: 15 MG/M3 TOTAL DUST
ACGIH TLV: 10 MG/M3 TDUST;8990
==========
Health Hazards Data
==========
LD50 LC50 Mixture: LD50 (INTRAVENOUS, AT) 35 MG/KG
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO

Effects of Exposure: ACUTE-INHALE:HIGH CONCENTRATIONS OF DUST MAY CAUSE IRRITATION.SKIN:NO ADVERSE EFFECTS.EYE:PARTICLES IN THE EYE MAY CAUSE IRRITATION.ORAL:INGESTION OF LARGE AMOUNTS MAY CAUSE INTESTINAL OBSTRUCTION.CHR ONIC-MAY CAUSE PNEUMOCONIOSIS,CHEST PAIN,COUGH,DYSPNEA,CYANOSIS,FATIGUE & BRONCHITIS.
Signs And Symptions Of Overexposure: HIGH CONCENTRATIONS OF DUST MAY CAUSE IRRITATION BY INHALATION. PARTICLES IN THE EYE MAY CAUSE IRRITATION. INGESTION OF LARGE AMOUNTS MAY CAUSE INTESTINAL OBSTRUCTION.
Medical Cond Aggravated By Exposure: PERSONS WITH PRE-EXISTING RESPIRATORY DISORDERS BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.
First Aid: GET MEDICAL ATTENTION IF SYMPTOMS PERSIST.SKIN:WASH WITH SOAP & WATER.EYE:FLUSH WITH WATER FOR 15 MINUTES,HOLDING EYELIDS OPEN.INHALED:REMOVE TO FRESH AIR & PROVIDE OXYGEN/CPR IF NEEDED.ORAL:DO NOT IN DUCE VOMITING.IF VOMITING OCCURS,KEEP HEAD BELOW HIPS DUE TO ASPIRATION HAZARD.TREAT SYMPTOMATICALLY AND SUPPORTIVELY.CALL PHYSICIAN.

==========

Handling and Disposal

==========

Spill Release Procedures: USE NIOSH APPROVED DUST MASK/RESPIRATOR & PROTECTIVE GLOVES. SWEEP UP OR VACUUM AND TRANSFER INTO A CONTAINER FOR LATER DISPOSAL OR RECOVERY.
Waste Disposal Methods: KEEP IN COVERED DRUMS, PENDING DISPOSAL. HANDLE & DISPOSE IN FULL COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE & LOCAL REGULATIONS.
Handling And Storage Precautions: STORAGE-STORE IN COOL,DRY,VENTILATED AREA AWAY FROM MOISTURE. KEEP CONTAINERS TIGHTLY CLOSED.
Other Precautions: AVOID CREATING DUST. PROVIDE ADEQUATE VENTILATION. DO NOT INHALE DUST. USE APPROVED DUST MASK/RESPIRATOR WHEN HANDLING MATERIAL ON LARGE SCALE.

==========

Fire and Explosion Hazard Information

==========

Flash Point Text: NONE
Extinguishing Media: WATER SPRAY, CO2, FOAM/DRY CHEMICAL. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL & FLUSH SPILLS AWAY.
Fire Fighting Procedures: WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPOR OR DUST.
Unusual Fire/Explosion Hazard: NEGLIGIBLE FIRE HAZARD

==========

Control Measures

==========

Respiratory Protection: USE NIOSH APPROVED DUST MASK/RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS.
Ventilation: GOOD GENERAL VENTILATION IS SUFFICIENT FOR MOST CONDITIONS (10 ROOM VOLUMES PER HOUR).
Protective Gloves: AS REQUIRED
Eye Protection: DUST-RESISTANT SAFETY GOGGLES
Other Protective Equipment: EYE WASH STATION, QUICK DRENCH SHOWER AND IMPERVIOUS CLOTHING
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.

==========

Physical/Chemical Properties

==========

HCC: N1
M.P/F.P Text: UNKNOWN

```
Decomp Text: UNKNOWN
Spec Gravity: UNKNOWN
Solubility in Water: INSOLUBLE
Appearance and Odor: VERY FINE, ODORLESS, HYGROSCOPIC, PALE BUFF OR
  CREAM-COLORED TO GRAYISH POWDER
Corrosion Rate: UNKNOWN
==========================================================
Reactivity Data
==========================================================
Stability Indicator: YES
Stability Condition To Avoid: MOISTURE. SWELLS TO APPROXIMATELY TWELVE TIMES
  ITS VOLUME WHEN ADDED TO WATER.
Materials To Avoid: LITHIUM: MOLTEN LITHIUM ATTACKS SILICATES.
Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE ACRID SMOKE
  AND IRRITATING FUMES.
Hazardous Polymerization Indicator: NO
==========================================================
Toxicological Information
==========================================================
==========================================================
Ecological Information
==========================================================
==========================================================
MSDS Transport Information
==========================================================
==========================================================
Regulatory Information
==========================================================
==========================================================
Other Information
==========================================================
==========================================================
Transportation Information
==========================================================
Responsible Party Cage: 1B464
Trans ID NO: 62923
Product ID: BENTONITE
MSDS Prepared Date: 11/06/1991
Review Date: 06/02/1992
MFN: 1
Multiple KIT Number: 0
Review IND: Y
Unit Of Issue: CN
Container QTY: 1
Type Of Container: CAN/PAIL
==========================================================
Detail DOT Information
==========================================================
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========================================================
Detail IMO Information
==========================================================
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
==========================================================
Detail IATA Information
```

```
==========================================================
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========================================================
Detail AFI Information
==========================================================
AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========================================================
HAZCOM Label
==========================================================
Product ID: BENTONITE
Cage: 1B464
Company Name: FISHER SCIENTIFIC CO.  CHEMICAL MFG DIV
Street: 1 REAGENT LANE
City: FAIRLAWN NJ
Zipcode: 07410-2802
Health Emergency Phone: 201-796-7100 OR 201-796-7523
Label Required IND: Y
Date Of Label Review: 06/02/1992
Status Code: C
MFG Label NO: UNKNOWN
Label Date: 06/02/1992
Origination Code: F
Eye Protection IND: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: ACUTE-INHALE:HIGH CONCENTRATIONS OF DUST MAY CAUSE
  IRRITATION.SKIN:NO ADVERSE EFFECTS.EYE:PARTICLES IN THE EYE MAY CAUSE
  IRRITATION.ORAL:INGESTION OF LARGE AMOUNTS MAY CAUSE INTESTINAL
  OBSTRUCTION.CHR ONIC-MAY CAUSE PNEUMOCONIOSIS,CHEST
  PAIN,COUGH,DYSPNEA,CYANOSIS,FATIGUE & BRONCHITIS.STORAGE-STORE IN
  COOL,DRY AREA.KEEP CONTAINERS TIGHTLY CLOSED.FIRST AID-GET MEDICAL ATTENTION
  IF SYMPTOMS PERSIST.S KIN:WASH WITH SOAP & WATER.EYE:FLUSH WITH WATER FOR
  15 MINUTES,HOLDING EYELIDS OPEN.INHALED:REMOVE TO FRESH AIR & PROVIDE
  OXYGEN/CPR IF NEEDED.ORAL:DO NOT INDUCE VOMITING.IF VOMITING OCCURS,KEEP HEAD
   BELOW HIPS.TREAT SYMPTOMATICALLY.CALL PHYSICIAN.
==========================================================
Disclaimer (provided with this information by the compiling agencies): This
  information is formulated for use by elements of the Department of Defense.
  The United States of America in no manner whatsoever expressly or implied
  warrants, states, or intends said information to have any application, use or
  viability by or to any person or persons outside the Department of Defense
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  United States of America should seek competent professional advice to verify
  and assume responsibility for the suitability of this information to their
  particular situation regardless of similarity to a corresponding Department
  of Defense or other government situation.
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International Chemical Safety Cards

BENTONITE

ICSC: 0384

BENTONITE
Wilkinite

CAS # 1302-78-9
RTECS # CT9450000
ICSC # 0384

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
• **INHALATION**		Avoid inhalation of fine dust and mist.	
• **SKIN**		Protective gloves.	
• **EYES**		Safety spectacles.	
• **INGESTION**			

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting (extra personal protection: P1 filter respirator for inert particles).		

SEE IMPORTANT INFORMATION ON BACK

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS GRANULES OR POWDER IN VARIABLE COLOUR. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** The substance is a weak base in suspension in water. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV not established.	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of dust. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the lungs , resulting in silicosis due to the presence of crystalline silica (see ICSC # 0808).
PHYSICAL PROPERTIES	Relative density (water = 1): 2.5	Solubility in water: none
ENVIRONMENTAL DATA		

NOTES

Bentonites are aluminate silicate and can contain crystalline silica. The content varies widely from less than 1% to about 24%.

ADDITIONAL INFORMATION

ICSC: 0384 **BENTONITE**

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

APPENDIX B

BIOLOGICAL RESOURCES

Appendix B. Biological Resources.

Table B-1.
Plant species documented within the survey area for the proposed WR CT Site.

Scientific Name	Common Name
Arctostaphylos purissima	La Purisima manzanita
Astragalus sp.	Locoweed
*Avena barbata**	Slender wild oat
Baccharis pilularis	Coyote bush
*Bromus hordeaceus**	Soft-chess brome
Cardionema ramosissima	Sand mat
*Carpobrotus chilensis**	Sea fig
Castilleja sp.	Owl's clover
*Conyza sp.**	Horseweed
*Cortaderia jubata**	Jubata grass
Croton californicus	Croton
Deinandra increscens ssp. *villosa*†	Gaviota tarplant
Deinandra increscens ssp. *increscens*	Tarplant
*Ehrharta calycina**	Veldt grass
Ericameria ericoides	Mock heather
*Erodium botrys**	Filaree
Filago sp.	Herba impia
*Gnaphalium luteo-album**	Cudweed
Gnaphalium ramosissimum	Pink everlasting
Gnaphalium stramineum	Annual everlasting
Hazardia squarrosa	Saw-toothed goldenbush
Heteromeles arbutifolia	Toyon
Heterotheca grandiflora	Telegraph weed
Horkelia cuneata ssp. *sericea*†	Kellogg's horkelia
*Juniperus sp.**	Juniper
Lessingia filaginifolia	California-aster
Lotus scoparius	California broom
Lupinus arboreus	Tree lupine
Madia gracilis	Slender tarweed
*Medicago polymorpha**	California burclover
*Pinus radiata**	Monterey pine
Plagiobothrys sp.	Popcorn flower
*Plantago coronopus**	Cutleaf plantain
Plantago erecta	Annual plantain
Rhamnus californica	California cofeeberry
*Rumex acetosella**	Sheep sorel
Salvia mellifera	Black sage
Senecio blochmaniae	Blochman's groundsel
*Silene gallica**	Windmill pink
Solidago spathulata	Coast goldenrod
*Sonchus asper**	Prickly sow thistle
Stephanomeria virgata ssp. *virgata*	Wire-lettuce

† Federal or State listed species
* Non-native species

Table B-2.
Wildlife species occurring within the survey area for the proposed WR CT Site.

Scientific Name	Common Name	Occurrence
Amphibians		
Aneides lugubris	Arboreal salamander	Potential
Bufo boreas	Western toad	Potential
Ensatina eschscholtzii	Ensatina	Potential
Hyla regilla	Pacific treefrog	Potential
Reptiles		
Anniella pulchra pulchra†	Silvery legless lizard	Potential
Coluber constrictor	Racer	Potential
Crotalus viridis	Western rattlesnake	Potential
Elgaria multicarinata	Southern alligator lizard	Potential
Eumeces skiltonianus	Western skink	Potential
Lampropeltis getula	Common kingsnake	Potential
Masticophis lateralis	Striped racer	Potential
Phrynosoma coronatum frontale†	California horned lizard	Potential
Pituophis catenifer	Gopher snake	Potential
Sceloporus occidentalis	Western fence lizard	Documented
Thamnophis elegans	Western terrestrial garter snake	Potential
Thamnophis sirtalis	Common garter snake	Potential
Birds		
Accipiter cooperii†	Cooper's hawk	Potential
Accipiter striatus†	Sharp-shinned hawk	Potential
Agelaius phoeniceus	Red-winged blackbird	Potential
Aphelocoma californica	Western scrub jay	Potential
Aquila chrysaetos†	Golden eagle	Potential
Archilochus alexandri	Black-chinned hummingbird	Potential
Athene cunicularia hypugea†	Western burrowing owl	Potential
Bubo virginianus	Great horned owl	Documented
Buteo jamaicensis	Red-tailed hawk	Potential
Buteo lineatus	Red-shouldered hawk	Potential
Buteo regalis†	Ferruginous hawk	Potential
Callipepla californica	California quail	Potential
Calypte anna	Anna's hummingbird	Potential
Carduelis lawrencei†	Lawrence's goldfinch	Potential
Carduelis psaltria	Lesser goldfinch	Potential
Carduelis tristis	American goldfinch	Potential
Carpodacus mexicanus	House finch	Potential
Carpodacus purpureus	Purple finch	Potential
Cathartes aura	Turkey vulture	Potential
Chamaea fasciata	Wrentit	Documented
Charadrius vociferus	Killdeer	Documented
Chondestes grammacus	Lark sparrow	Potential
Circus cyaneus	Northern harrier	Potential
Colaptes auratus	Northern flicker	Documented
*Columba livia**	Rock dove	Potential
Corvus brachyrhynchos	American crow	Documented
Elanus leucurus†	White-tailed kite	Potential
Empidonax difficilis	Pacific-slope flycatcher	Potential
Euphagus cyanocephalus	Brewer's blackbird	Potential
Falco columbarius†	Merlin	Potential
Falco sparverius	American kestrel	Documented
Geococcyx californianus	Greater roadrunner	Potential
Lanius ludovicianus†	Loggerhead shrike	Documented

Scientific Name	Common Name	Occurrence
Birds		
Melospiza lincolnii	Lincoln's Sparrow	Documented
Melospiza melodia	Song sparrow	Documented
Mimus polyglottos	Northern mockingbird	Potential
*Molothrus ater**	Brown-headed cowbird	Potential
Passerella iliaca	Fox sparrow	Potential
Passerina amoena	Lazuli bunting	Potential
Pipilo crissalis	California towhee	Potential
Pipilo maculatus	Spotted towhee	Documented
Psaltriparus minimus	Bushtit	Potential
Sayornis nigricans	Black phoebe	Documented
Sayornis saya	Say's phoebe	Documented
Selasphorus sasin†	Allen's hummingbird	Potential
Sturnella neglecta	Western meadowlark	Documented
*Sturnus vulgaris**	European starling	Documented
Thryomanes bewickii	Bewick's wren	Documented
Toxostoma redivivum†	California thrasher	Potential
Troglodytes aedon	House wren	Potential
Turdus migratorius	American robin	Potential
Tyto alba	Barn owl	Potential
Zenaida macroura	Mourning dove	Documented
Zonotrichia atricapilla	Golden-crowned sparrow	Potential
Zonotrichia leucophrys	White-crowned sparrow	Documented
Mammals		
Canis latrans	Coyote	Documented
Chaetodipus californicus	California pocket mouse	Potential
*Didelphis virginiana**	Virginia opossum	Potential
Dipodomys agilis	Pacific kangaroo rat	Potential
Dipodomys heermanni	Heermann's kangaroo rat	Potential
Dipodomys sp.	Kangaroo rat	Documented
Lepus californicus	Black-tailed jackrabbit	Potential
Lynx rufus	Bobcat	Potential
Mephitis mephitis	Striped skunk	Potential
Microtus californicus	California vole	Potential
Mustela frenata	Long-tailed weasel	Potential
Odocoileus hemionus	Mule deer	Documented
Peromyscus californicus	California mouse	Potential
Peromyscus maniculatus	Deer mouse	Potential
Procyon lotor	Raccoon	Potential
Puma concolor	Mountain lion	Potential
Reithrodontomys megalotis	Western harvest mouse	Potential
Sorex ornatus	Ornate shrew	Potential
Sorex trowbridgii	Trowbridge's shrew	Potential
Spermophilus beecheyi	California ground squirrel	Potential
*Sus scrofa**	Wild pig	Potential
Sylvilagus bachmani	Brush Rabbit	Documented
Taxidea taxus	American badger	Documented
Thomomys bottae	Botta's pocket gopher	Potential
Urocyon cinereoargenteus	Gray fox	Potential

† Federal or State listed species

* Non-native species

APPENDIX C

CULTURAL RESOURCES

Appendix C. Cultural Resources.

Cultural Setting

The following summary of prehistory and ethnohistory is modified from Lebow and Moratto (2001). The historic overview derives primarily from Palmer (1999).

Prehistory

The prehistory of California's central coast spans the entire Holocene and may extend back to late Pleistocene times. In the Santa Barbara Channel region, a fluted Clovis point found on the surface of a coastal site suggests use of the area possibly as early as 11,000-12,000 years ago (Erlandson *et al.* 1987), while a site on San Miguel Island has yielded a radiocarbon date of 10,300 B.P. (Erlandson 1991). Recent calibrations suggest that terminal Pleistocene radiocarbon dates are about 2,000 years too recent (Fiedel 1999:95) and thus these early sites may be even older. In San Luis Obispo County, excavations at CA-SLO-2 in Diablo Canyon revealed an occupation older than 9,000 years (Greenwood 1972; Moratto 1984) and investigations at CA-SLO-1797 indicate initial occupations as early as 10,300 B.P. (Fitzgerald 1998). Occupations on Vandenberg AFB occurred by at least 9,000 years ago, based on radiocarbon dates from CA-SBA-931 at the mouth of the Santa Ynez River (Glassow 1990, 1996).

Moratto (1984) refers to these early occupations as Paleocoastal. Population densities were probably low, judging from the limited number of sites dated to this period. Diagnostic tools associated with this time period have not been identified, although similarities with the San Dieguito Complex in southern California (Wallace 1978; Warren 1967) have been suggested (Erlandson 1994). Cultural assemblages have few of the grinding implements common to subsequent periods. These sites are characterized by a strong maritime orientation and an apparent reliance on shellfish. Occupants are thought to have lived in small groups that had a relatively egalitarian social organization and a forager-type land-use strategy (Erlandson 1994; Glassow 1996; Greenwood 1972; Moratto 1984).

Site densities throughout the central coast are higher during the subsequent periods, suggesting increased population size and possibly better site preservation. Sites dating between about 8,000 and 6,500 years ago often have relatively high densities of manos and milling slabs that are typically associated with processing seeds. These milling stones are diagnostic of this period. Shellfish appear to have continued as a dietary staple throughout the central coast (Erlandson 1994; Glassow and Wilcoxon 1988), including Vandenberg AFB (Glassow 1996; Woodman *et al.* 1995). However, terrestrial mammals composed a larger portion of the diet on Vandenberg AFB during this period than during any other time (Glassow 1996; Rudolph 1991). Fish were a larger part of the diet than shellfish at Morro Bay in San Luis Obispo County, although shellfish were better represented during this period than during subsequent periods (Jones *et al.* 1994).

Early scholars associated sites of this age with inland knolls and terraces (e.g., Rogers 1929), but subsequent investigations revealed that coastal environments were also used (e.g., Glassow *et al.* 1988). Well-developed middens at many sites suggest a more sedentary and stable settlement system (Breschini *et al.* 1983). Glassow (1990, 1996) infers that occupants of Vandenberg AFB during this time were sedentary and had begun using a collector-type (i.e., logistically mobile) land-use strategy. Burial practices suggest that society was primarily egalitarian (Glassow 1996).

Population densities appear to have decreased substantially between 6500 and 5000 B.P. throughout the region, and little is known about this period. It is possible that arid conditions associated with the Altithermal degraded the environment to the point that only low population densities were possible (Glassow 1996; Glassow and Wilcoxon 1988).

After 5000 B.P., population densities increased to pre-6500 B.P. levels as conditions became cooler and more moist. Between 5000 and 3000 B.P., mortars and pestles became increasingly common throughout the region, suggesting intensified use of acorns (Basgall 1987), although these implements may have been associated with processing pulpy roots or tubers (Glassow 1997). Along the Santa Barbara Channel coastline, use of shellfish declined as other animal foods became more important. Use of more diverse environmental settings is suggested (Erlandson 1997). On Vandenberg AFB, fish and sea mammals composed a larger part of the diet during this period. Large side-notched and stemmed projectile points became more prevalent in the archaeological record, presumably reflecting increased hunting, although Glassow (1996) suggests that proportions of terrestrial mammals do not surpass the pre-6500 B.P. levels. However, higher proportions of terrestrial mammals in archaeological assemblages are associated with this period in San Luis Obispo County. Increased logistical organization is suggested in this area (Jones *et al.* 1994; Jones and Waugh 1995). Proportions of obsidian (indicating exchange with other regions) increased after about 5000 B.P., particularly in San Luis Obispo County (Jones *et al.* 1994; Jones and Waugh 1995).

Cultural complexity appears to have increased around 3,000-2,500 B.P. Based on mortuary data from the Santa Barbara area, King (1981, 1990) suggests a substantial change in social organization and political complexity about 3,000 years ago. According to King, high-status positions became hereditary and individuals began to accumulate wealth and control exchange systems. Arnold (1991, 1992) proposes that this evolutionary step in socioeconomic complexity occurred around 700-800 years ago.

The period between 2,500 and 800 years ago is marked by increased cultural complexity and technological innovation. Fishing and sea mammal hunting became increasingly important, corresponding to development of the *tomol* (a plank canoe), single-piece shell fishhooks, and harpoons (Glassow 1996; King 1990). The bow and arrow also was introduced during this period (Glenn 1990, 1991). Sites in San Luis Obispo County suggest that use of terrestrial mammals remained high. Proportions of imported obsidian continued to increase during this period (Jones *et al.* 1994).

Arnold (1992) proposes that the complex Chumash sociopolitical system known at historic contact evolved substantially during a brief period between A.D. 1150 and 1300, which she terms the Middle/Late Transitional Period. Arnold infers that decreased marine productivity caused by elevated sea-surface temperatures resulted in subsistence stress that allowed an elite population to control critical resources, labor, and key technologies, resulting in hierarchical social organization and a monetary system. Although the issue of elevated sea-surface temperatures has been questioned (e.g., Kennett 1998) and the inference of marine degradation and subsistence stress has been challenged (e.g., Raab *et al.* 1995; Raab and Larson 1997), the full emergence of Chumash cultural complexity around this time is generally accepted.

On Vandenberg AFB and in the Santa Barbara Channel region, population densities reached peak levels between 700 years ago and historic contact (Glassow 1990, 1996). Higher numbers of *Olivella* shell beads reflect increased exchange between the Channel Islands, the Santa Barbara mainland, and Vandenberg AFB. Increased subsistence diversity is apparent. Although shellfish continued to be a dietary staple in the Vandenberg area, the use of fish and birds increased, proportions of secondary species in shellfish assemblages increased (Glassow 1990), and dietary expansion is evident (Lebow and Harro 1998). Correspondingly, the range and diversity of site types increased as a greater range of habitats and resources was used (Glassow 1990; Lebow and Harro 1998; Woodman *et al.* 1991). In San Luis Obispo County, the settlement system appears to have changed substantially after 700 B.P. as residential bases along the coast were abandoned in favor of habitation sites farther inland. Coastal sites were used to obtain resources during short-term occupations (Breschini and Haversat 1988; Greenwood 1972; Jones *et al.* 1994; Jones and Waugh 1995). In addition, proportions of imported obsidian decreased substantially during this period (Jones *et al.* 1994).

Ethnohistory

People living in the Vandenberg AFB area prior to historic contact are grouped with the Purisimeño Chumash (Greenwood 1978; King 1984; Landberg 1965), one of several linguistically related members of the Chumash culture. Their social organization, traditions, cosmology, and material culture are described by Blackburn (1975), Grant (1978a, 1978b, 1978c, 1978d), Greenwood (1978), Hudson *et al.* (1977), Hudson and Blackburn (1982, 1985, 1986), Hudson and Underhay (1978), Johnson (1988), and Landberg (1965).

Accounts of early explorers in the Santa Barbara Channel area indicate that the Chumash people lived in large, densely populated villages with well-built structures (e.g., Bolton 1926, 1931; Engelhardt 1933; Fages 1937; Moriarity and Keistman 1968; Simpson 1939; Teggart 1911; Wagner 1929). With a total Chumash-speaking population estimated at 18,500 (Cook 1976) and employing a maritime economy, the Chumash had a culture that "was as elaborate as that of any hunter-gatherer society on earth" (Moratto 1984:118). Leadership was hereditary and chiefs exercised control over more than one village, reflecting a simple chiefdom social organization. The Chumash engaged in craft specialization and maintained exchange systems (Arnold 1992; Johnson 1988).

Relatively little is known about the Chumash in the Vandenberg region. Explorers noted that villages were smaller and lacked the formal structure found in the channel area (Greenwood 1978:520). Approximately 22 villages were used by the Purisimeño Chumash at historic contact, with populations between 30 and 200 per village (Glassow 1996:13-14). About five ethnohistoric villages are identified by King (1984:Figure 1) on Vandenberg AFB, along with another five villages in the general vicinity.

Unfortunately, early explorers paid scant attention to Chumash subsistence and settlements systems. Using ethnohistoric, ethnographic, and archaeological data, Landberg (1965) attempted to reconstruct those facets of Chumash lifeways. Chumash subsistence relied primarily on fishing, hunting, and gathering plants (primarily acorns). In the spring, groups left their winter villages for temporary camps where they gathered grasses, roots, tubers, and bulbs. Hunting marine mammals became important during times when seals and sea lions congregated at their rookeries. Bulbs, roots, and tubers also were gathered during the summer months as well, and seeds became important during this season, especially to the people north of Point Concepción. Interior groups moved to the coast during the spring and summer to collect shellfish. Coastal groups returned to

their villages in late summer and early fall to harvest large schooling fish such as tuna. Pine nuts were collected in the mountains during the fall months; acorns also were gathered in the late fall. Both of these resources, as well as berries collected during the late summer and early fall, were stored for use during the winter. Hunting also was important during the fall. Winter months were spent in villages, where residents relied primarily on stored foodstuffs as well as occasional fresh fish (Landberg 1965:102-104). Regional variation in subsistence strategies is evident in the ethnohistoric record (Landberg 1965:104-118); in the interior and along the northern coast of Chumash territory, marine resources were less important than acorns, seeds, and game (particularly deer).

Contact with early Euroamerican explorers, beginning with the maritime voyages of Cabrillo in A.D. 1542-1543, undoubtedly had an effect on the Chumash culture. The effect may have been profound. Erlandson and Bartoy (1995, 1996) and Preston (1996) convincingly argue that Old World diseases substantially impacted Chumash populations more than 200 years before Spanish occupation began in the 1770s.

Unquestionably, drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769. The first mission in Chumash territory was established in San Luis Obispo in 1772, followed in short order by San Buenaventura (1782), Santa Barbara (1786), and La Purísima Concepción, established in 1787 in the present location of Lompoc. The Santa Ynez Mission was established in 1804. Eventually, nearly the entire Chumash population was under the mission system (Grant 1978a). During the 1830s, the missions were secularized in an attempt to turn the mission centers into pueblos and make the Indians into Mexican citizens.

History

Vandenberg AFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods (Palmer 1999). The Mission Period began with the early Spanish explorers and continued until 1820. Established in 1787, Mission La Purísima encompassed the area between Gaviota and Guadalupe. Farming and ranching were the primary economic activities at the Mission, which was responsible for supplying the Santa Barbara Presidio with food supplies. The Mission had 4,000 head of sheep by 1800; by 1812 they numbered 12,000 and by 1821 the count peaked at 23,546. Missionaries had the Chumash weave wool blankets for the Santa Barbara Presidio. Approximately 14,000 sheep remained when the Mission closed in 1835. In addition to sheep, wheat, barley, corn, peas, and beans were grown at Mission La Purísima. Agricultural activities primarily occurred along the major streams such as San Antonio Creek and the Santa Ynez River (Palmer 1999:2). A farming outpost for Mission La Purisima was established at the ethnohistoric village of *Estep* in the San Antonio Creek valley, several miles upstream from the proposed Western Range Command Transmit site (Palmer 1999:Appendix 1).

The Rancho Period of Vandenberg AFB history began in 1820 and continued until 1845 (Palmer 1999). Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. The Western Range Command Transit Site lies within Rancho Jesus Maria, which originally encompassed 42,184 acres and was granted to Lucas, Antonio, and Jose Olivera in 1837. Rancho Jesus Maria included lands from just south of Shuman Canyon (northern boundary) to the Santa Ynez River (southern boundary), and from the Pacific Ocean to a few kilometers east of San Antonio Terrace and Burton Mesa on the east (Tetra Tech 1988). Lucas Olivera is thought to have constructed an adobe at the site of the Marshallia Ranch

in 1837; this site is located about 1.3 miles northeast of the El Rancho Road bridge replacement project. By 1839, Antonio and Jose Olivera had sold their part of the land grant to Jose Valenzuela, who, in 1847, sold a one-third share to Don Pedro Carrillo and a one-third share to Lewis T. Burton. Cattle ranching was the primary economic activity during the Rancho Period; in the 1840s cattle were so abundant that only the hides had any value (Palmer 1999).

The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845-1880). Cattle ranching continued to flourish during the early part of this period, with as many as 500,000 cattle in Santa Barbara County during the 1850s. However, severe droughts during the 1860s decimated cattle herds and less than 5,000 cattle remained in the entire county. The combination of drought and change in government from Mexican to the United States caused substantial changes in land ownership. By 1851, approximately 42 percent of the land grants were owned by non-Mexicans; by 1864, after a few years of drought, 90 percent of the southern California ranchos were mortgaged. The various shares in Rancho Jesus Maria changed hands, with Lewis Burton increasing his holdings. His son, Ben Burton, inherited all of Rancho Jesus Maria upon the death of Burton in 1879. Sheep ranching and grain farming replaced the old rancho system during this period. Dairy farming became an important economic activity during this time, particularly as Swiss-Italians immigrated into the area. Early roads were established during the 1860s and 1870s to obtain supplies that were surfed in at Point Sal. Farming remained a limited activity, due in part to the difficulty of shipping to markets. Lompoc was established during this period by the Lompoc Temperance Colony (Palmer 1999).

Increased population densities characterize the Americanization Period (1880-1915). The railroad reached the area in the late 1890s, and providing a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching continued and agriculture increased, particularly with development of steam-powered threshers. Row crops became increasingly common, and sugar beets were one of the most economically important crops. Union Sugar Company had a substantial influence on economic growth in the region. Oil exploration began in earnest during this period. Union Oil began to purchase Rancho Jesus Maria property in 1903; they ultimately obtained subsurface rights to 120,000 acres in the area. Ben Burton leased the former Rancho Jesus Maria for grazing and farming during the early part of the Americanization Period. However, by 1900 the rancho was divided into four parcels and sold. These four parcels were further subdivided by 1906. Edwin Marshall formed the Jesus Maria Rancho Corporation in December of 1906; by the 1920s the Marshall Ranch encompassed 52,000 acres and prospered by raising cattle and beets. Its headquarters were constructed between 1906 and 1933 at the location of the Olivera adobe. An elaborate system of line camps and other facilities supported the ranch operations. Marshall also introduced eucalyptus trees as a potential source of commercial firewood.

Ranching and farming continued on the Marshall Ranch during the early part of The Period of Regional Culture (1915-1945). At various times, the Marshall Ranch experimented with game birds, chickens, turkeys, and purebred bulls. Grain was raised on coastal terraces, and Union Sugar purchased farm land in the San Antonio Valley from Marshall for agricultural purposes. In 1933, the Marshall family moved to the Olivera adobe, and expanded and modernized the building. A wooden-framed guest house was added in 1935 and a dude ranch operation began. The facility became known as the Marshallia Ranch and catered to Hollywood personalities. Visitors could arrive by airplane at an air strip in front of the house, and they could enjoy ranching activities, horseback riding, or tennis. The ranch was sold to Frank Long upon the death of Edwin Marshall in 1937. Cattle ranching and guest operations continued until the start of World War II, when the property was condemned for Camp Cooke. However, the army allowed the Marshallia Ranch to stay open to serve army officers. All ranching, farming, and dairy farming in the Vandenberg AFB area was substantially reduced when Camp Cooke was established in 1941. This army training

facility was built on approximately 90,000 acres along the coast, and included the area of Rancho Jesus Maria. Camp Cooke was deactivated at the end of World War II (Palmer 1999).

The Suburban Period (1945B1965) began with the end of World War II. After Camp Cooke was deactivated, the Army continued the historic tradition and leased much of the area for ranching and farming. Oil drilling reached its peak during this period. Union Oil drilled a number of wells on the San Antonio Terrace, and the Jesus Maria No. 4 produced commercial quantities of oil. Most of the Suburban Period is characterized by military use of the area. Camp Cooke was reactivated in 1950 for training during the Korean War. It was put into caretaker status from 1953 to 1956. The Cantonment area became so overgrown that sheep were used to manage the vegetation and reduce the fire hazard. In November of 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed the Cooke Air Force Base (Palmer 1999). In 1958 the base had its first missile launch, the Thor, and was renamed Vandenberg AFB. The southern section of the current base was transferred to the Air Force from Army and Navy control in 1964 (Vandenberg AFB 1992). Post-transfer use of both North and South Vandenberg AFB has related primarily to the construction and operation of missile launch and support facilities. Specific activities include management of the launch, testing, and evaluation of ballistic missile and space systems for the DOD, and operation of the Western Range (Science Applications International Corporation [SAIC] 1995; Vandenberg AFB 1992).

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APPENDIX D

AIR QUALITY ANALYSIS

Appendix D. Air Quality Analysis

Technical Assumptions and Emission Calculation

The Proposed Action is to construct and operate a Western Range (WR) Command Transmit (CT) Site on Vandenberg Air Force Base (AFB), California, that would serve as a docking facility for two command transmitters to transmit radio carrier and frequency-modulated radio messages to launch vehicles, to activate flight termination functions in the event of an anomaly. Data for this analysis was obtained from 30th Space Wing Civil Engineer Squadron (30 CES) and the 30th Space Wing Space Communication Squadron (30 SCS) personnel involved with preparing the engineering analysis for the Proposed Action.

Proposed Action – Construction

Construction of the WR CT Site is scheduled to take 10 months, with a work schedule of eight hours per day, five days per week. The estimated crew size is six workers per activity for the length of the project. Average one-way commute for employees was assumed at 15 miles. Average project related pick-up truck commute was assumed at six miles. All delivery supply trucks were assumed to travel 60 miles one-way, while concrete trucks were assumed to travel 15 miles one-way.

Maps were used to estimate the area disturbed by the construction equipment. It was assumed that for a reasonable worst-case day, one-fifth the area would be disturbed, while for the average, one-tenth of the area would be disturbed.

Detailed analysis of the construction equipment for the Proposed Action is presented in Table D-1. Detailed analysis of the factors used to estimate the construction emissions are presented in Table D-2. Assumptions, based on normal construction practices were needed to augment the Vandenberg AFB data to estimate the construction emissions for the Proposed Action.

The emissions from the various sources were estimated on daily and project basis. The daily emissions were calculated by multiplying the emission factor by the appropriate equipment usage rate. Except for the PM_{10} emissions, the project emissions were estimated by multiplying the daily emissions for each source by the duration of the project. For the PM_{10} emissions, the project emissions were obtained by multiplying the average area disturbed by the length of the day and the duration of the project. Daily and total emissions for construction are presented in Tables D-3 and D-4, respectively.

Table D-1. Construction equipment usage for WR CT Site.

Emission Source	Fuel[e]	Horse Power Rating (HP)	Load Factor	Number of Units	Daily Duration (Hours)[d]	Proposed Action Usage		% of Proposed Action[d]
						Days	Hours	
Delivery Semi-Truck, Cat C15 Engine[f]	D	60	NA	1	4	160	640	80%
Trencher and plow, Ditch Witch, RT115	D	115	0.48	1	8	30	240	15%
Backhoe/Skiploader, Cat 410D	D	97	0.465	1	6	100	600	50%
Bulldozer, Track, John Deere 450H	D	74	0.59	2	6	100	1,200	50%
Crane, 25 Ton, RT552	D	152	0.43	1	2	100	200	50%
Compactor Ingersol Rand, SD-40	D	80	0.66	1	4	100	400	50%
Dump Truck, End	D	250	0.47	2	3	60	360	30%
Concrete Truck, Cat C11 Engine[a]	D	15	NA	4	8	20	640	10%
Generator Diesel , 48kW	D	64	0.74	1	8	10	80	5%
Boring Jack Unit, DD-1, American Augers	D	20	0.75	1	8	10	80	5%
Compactor Asphalt, Cat CB-434C	D	70	0.53	1	8	20	160	10%
Paver, Cat, BG-240	D	153	0.59	1	8	20	160	10%
Water Truck Ford L-800	D	210	0.47	1	4	100	400	50%
Street Sweeper, Sweepmaster 25, Waldon	D	80	0.68	1	1	160	160	80%
Pick-up Truck[c]	D	6	NA	2	4	200	4,800	100%
Miscellaneous Delivery Trucks[f]	NA	60	NA	2	NA	60	14,400	30%
Six Worker Commuting Vehicles per Day[a,g]	NA	15	NA	6	NA	200	36,000	100%
Fugitive Dust[b,g] - Peak Day	NA	8.27	NA	NA	8	1	NA	0.5%
Fugitive Dust[b,g] - Average Day	NA	0.83	NA	NA	8	200	NA	100%

Notes:
a Horse Power Rating is the number of miles traveled in one-way trip from Santa Maria. Project usage is total mileage.
b Horse Power Rating is acres disturbed per day. Calculations include total analyzed area, which is less than the total disturbed area.
c Horse Power Rating is average one-way mileage for traveling on site and coordinating north base activities. Number of Units is trips per day. Project Usage is total mileage.
d Same as Table 2-2 Equipment Use in Chapter 2, DOPAA, 10 Months, 5 work days/week=200 days total.
e D is diesel and G is gasoline
f Horse Power Rating is miles traveled in one-way trip from 60 miles. Number of Units is trips per day. Project Usage is total mileage.
g Same as EA paragraph 2-1, six workers per activity working eight-hour days.

Table D-2. Emission factors used to estimate construction emissions for WR CT Site.

Emission Source	Emission Factors (gm/BHP-hr)					Vehicle category[a]
	CO	NO_x	PM_{10}	ROC	SO_x	
Delivery Semi-Truck, Cat C15 Engine[b]	0.020984	0.028142	0.000500	0.002955	0.000246	On-Road Motor Vehicles
Trencher and plow, Ditch Witch, RT115	2.15	11.00	0.66	0.88	0.19	Track-type Tractor
Backhoe/Skiploader, Cat 410D	2.71	11.00	0.78	1.12	0.20	Wheeled Loader
Bulldozer, Track, John Deere 450H	2.15	8.80	0.66	0.88	0.19	Track-type Tractor
Crane, 25 Ton, RT552	4.60	11.00	0.86	1.16	0.21	Miscellaneous
Compactor Ingersol Rand, SD-40	4.60	11.00	0.86	1.16	0.21	Miscellaneous
Dump Truck, End	2.28	11.00	0.48	0.57	0.20	Off-Highway Truck
Concrete Truck, Cat C11 Engine[b]	0.020984	0.028142	0.000500	0.002955	0.000246	On-Road Motor Vehicles
Generator, 48kW	3.03	14.00	0.96	1.27	0.21	Industrial
Boring Jack Unit, DD-1, American Augers	4.60	11.00	0.86	1.16	0.21	Miscellaneous
Compactor Asphalt, Cat CB-434C	6.03	11.00	0.75	1.12	0.23	Roller
Paver, Cat, BG-230	4.60	11.00	0.86	1.16	0.21	Miscellaneous
Water Truck Ford L-800	2.28	11.00	0.48	0.57	0.20	Off-Highway Truck
Street Sweeper, Sweepmaster 25, Waldon	4.60	11.00	0.86	1.16	0.21	Miscellaneous
Pick-up Truck[b]	0.015165	0.001634	0.000079	0.001626	0.000010	On-Road Motor Vehicles
Miscellaneous Delivery Trucks[b]	0.020984	0.028142	0.000500	0.002955	0.000246	EMFAC 1965-2005
Worker Commuting[b]	0.015165	0.001634	0.000079	0.001626	0.000010	EMFAC 1965-2005
Fugitive Dust[c]	0.00	0.00	3.49	0.00	0.00	SBCAPCD

Note:
a Emission factors from SBCAPCD Form 24, Construction Equipment Uncontrolled Emission Factors.
b Emission factor from South Coast Air Quality Management District (SCAQMD) CEQA, On-Road Vehicles 2005 are in lbs/mile. EMFAC 2002 (version 2.2).
c Emission factor from SBCAPCD Form 24, Construction Equipment Uncontrolled Emission Factors, Fugitive Dust. Site watering will reduce PM10 emissions with 50% credit. PM10 (controlled) equals PM value times 0.64 times 0.50.

Table D-3. Proposed Action for WR CT Site daily construction emissions.

Emission Source	Daily Emmissions (lbs)				
	CO	NO_x	PM_{10}	ROC	SO_x
Delivery Semi-Truck, Cat C15 Engine[a]	2.5	3.4	0.1	0.4	0.0
Trencher and plow, Ditch Witch, RT115	2.1	10.7	0.6	0.9	0.2
Backhoe/Skiploader, Cat 410D	1.6	6.6	0.5	0.7	0.1
Bulldozer, Track, John Deere 450H	2.5	10.2	0.8	1.0	0.2
Crane, 25 Ton, RT552	1.3	3.2	0.2	0.3	0.1
Compactor Ingersol Rand, SD-40	2.1	5.1	0.4	0.5	0.1
Dump Truck, End	3.5	17.1	0.7	0.9	0.3
Concrete Truck, Cat C11 Engine[a]	2.5	3.4	0.1	0.4	0.0
Generator, 48kW	2.5	11.7	0.8	1.1	0.2
Boring Jack Unit, DD-1, American Augers	1.2	2.9	0.2	0.3	0.1
Compactor Asphalt, Cat CB-434C	3.9	7.2	0.5	0.7	0.2
Paver, Cat, BG-230	7.3	17.5	1.4	1.8	0.3
Water Truck Ford L-800	2.0	9.6	0.4	0.5	0.2
Street Sweeper, Sweepmaster 25, Waldon	0.6	1.3	0.1	0.1	0.0
Pick-up Truck[a]	0.4	0.0	0.0	0.0	0.0
Miscellaneous Delivery Trucks[a]	5.0	6.8	0.1	0.7	0.1
Worker Commuting[a]	2.7	0.3	0.0	0.3	0.0
Fugitive Dust	0.0	0.0	23.1	0.0	0.0
Total Daily Construction(lbs)	**43.9**	**116.9**	**30.0**	**10.6**	**2.0**

Note:
a Total daily emissions are based on miles driven.

Table D-4. Proposed Action for WR CT Site total construction emissions.

Emission Source	Project Emissions (lbs)				
	CO	NO_x	PM_{10}	ROC	SO_x
Delivery Semi-Truck, Cat C15 Engine[a]	13.4	18.0	0.3	1.9	0.2
Trencher and plow, Ditch Witch, RT115	62.8	321.3	19.3	25.7	5.5
Backhoe/Skiploader, Cat 410D	161.7	656.3	46.5	66.8	11.9
Bulldozer, Track, John Deere 450H	248.3	1,016.4	76.2	101.6	21.9
Crane, 25 Ton, RT552	132.6	317.0	24.8	33.4	6.1
Compactor Ingersol Rand, SD-40	214.2	512.2	40.0	54.0	9.8
Dump Truck, End	212.6	1,025.8	44.8	53.2	18.7
Concrete Truck, Cat C11 Engine[a]	13.4	18.0	0.3	1.9	0.2
Generator, 48kW	25.3	116.9	8.0	10.6	1.8
Boring Jack Unit, DD-1, American Augers	12.2	29.1	2.3	3.1	0.6
Compactor Asphalt, Cat CB-434C	78.9	144.0	9.8	14.7	3.0
Paver, Cat, BG-230	146.5	350.3	27.4	36.9	6.7
Water Truck Ford L-800	198.4	957.4	41.8	49.6	17.4
Street Sweeper, Sweepmaster 25, Waldon	88.3	211.1	16.5	22.3	4.0
Pick-up Truck[a]	72.8	7.8	0.4	7.8	0.0
Miscellaneous Delivery Trucks[a]	302.2	405.2	7.2	42.6	3.5
Worker Commuting[a]	545.9	58.8	2.9	58.5	0.4
Fugitive Dust	0.0	0.0	1,526.0	0.0	0.0
Total Proposed Action Construction (lbs)	**2,529.51**	**6,165.61**	**1,894.47**	**584.58**	**111.62**
Total Proposed Action Construction (Tons)	**1.26**	**3.08**	**0.95**	**0.29**	**0.06**

Note:
a Total emissions are based on miles driven.

Proposed Action – Operations

Operational data was derived from previous years estimates for launches and back-up generator hours. Current operations support 16 launches per year that require four personnel per launch for two full days (three shifts). Current back-up diesel generator (500Hp) operates on average 45 hours per year.

The proposed WR Ct facility would replace the current operational activities; however, there are two differences in the new facility operational activities; (1) Personnel will have an eight-mile roundtrip reduction in distance for travel to the new facility; and (2) there would be two 750-Hp back-up generator diesel internal combustion engines (instead of one 500-Hp). The proposed back-up generators will comply with the Stationary Diesel Airborne Toxic Control Measures (ATCM) standards. The analyses of operational activities and total operations emission factors are presented in Tables D-5 and D-6 respectively. Total annual operational emissions are included in Table D-7.

Table D-5. Operational activities for Western Range Command Transmit Site.

Emission Source	Fuel[a]	Horse Power Rating (HP)	Load Factor	Number of Units[b]	Daily Duration (Hours)	Proposed Action Use (Days)	Project Usage (Hours)[c]
Two Backup Generators	D	750	0.8	2	45	1	90
Six Worker Commuting Vehicles per Day[d]	NA	15	NA	20	NA	32	19,200

Notes:
a D is diesel .
b Number of Units is trips per day.
c Project usage is total mileage.
d Horse Power Rating is the number of miles traveled in one-way trip from Santa Maria. (These are current average operational activities: Four people per shift, three shifts per day, 16 launches per year, two days per launch. Two carpools per day.)

Table D-6. Emission factors used to estimate operational emissions for Western Range Command Transmit Site.

Emission Source	Emission Factors (gm/BHP-hr)					Vehicle Category[b]
	CO	NO_x	PM_{10}	ROC[d]	SO_x[c]	
Two Backup Generators	2.6	4.8	0.15	0.30	0.17	SBCAPCD
Six Worker Commuting Vehicles per Day[b]	0.015165	0.001634	0.000079	0.001626	0.000010	EMFAC 1965-2005

Notes:
a SBCAPDC Final Regulation Order, Airborne Toxic Control Measure For Stationary Compression Ignition Engines.
b Emission factor from South Coast Air Quality Management District (SCAQMD) CEQA, On-Road Vehicles 2005 are in lbs/mile. EMFAC 2002 (Version 2.2).
c APCD -42, Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines, Table 3.4-1.
d SBCAPCD, Technical Information and References, ROC/VOC Emission Factors and Reactivities for Common Source Types (Version 1.2, March 12, 2001)

Table D-7. Proposed Action for Western Range Command Transmit Site operational total emissions.

Emission Source	Annual Total Operational Emissions (Lbs and Tons)				
	CO	NO_x	PM_{10}	ROC	SO_x
Two Backup Generators	309.52	571.43	17.86	35.71	20.24
Six Worker Commuting Vehicles per Day[a]	291.2	31.4	1.5	31.2	0.2
Total Operational Proposed Action (Lbs)	**600.69**	**602.80**	**19.38**	**66.93**	**20.43**
Total Operational Proposed Action (Tons)	**0.30**	**0.30**	**0.01**	**0.03**	**0.01**

Note:
a Total emissions are based on miles driven.

Conformity Determination

The U.S. Air Force is required to make a formal conformity analysis to determine whether the Proposed Action at Vandenberg AFB complies with the air conformity rule found in the Clean Air Act (CAA). This determination is in accordance with conformity requirements set for the in 40 Code of Federal Regulations (CFR) 93.153 (b) and (c), *Determining Conformity of Federal Actions to State or Federal Implementation Plans, Applicability,* and section 176(c)(4) of the CAA.

Background

The Environmental Protection Agency (EPA) Final Conformity Rule requires federal agencies to ensure that any agency activity conforms to state- or federally-approved implementation plans. Conformity means ensuring the federal activity will not:

1) Cause a new violation of the National Ambient Air Quality Standards (NAAQS);
2) Contribute to an increase in the frequency or severity of violations of existing NAAQS; or
3) Delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment.

The general conformity rule applies to federal actions that are not covered by the transportation conformity rule. Other than the listed exemptions and presumptions of conformity, the general conformity rule applies to actions in which projected emissions exceed applicable conformity *de minimis* thresholds. If project emissions are less than *de minimis* thresholds and are 10 percent or more of a nonattainment or maintenance area's total emissions of any criteria pollutant, then the action is considered "regionally significant" and the requirements of conformity determination apply. If the Proposed Action's direct and indirect emissions are less than the established *de minimis* thresholds, and are not considered regionally significant, the project is then assumed to be in conformity, and formal reporting of the conformity determination is not required.

Emission Thresholds and Quantification

The emission threshold for determining conformity is based on the NAAQS attainment standard for Santa Barbara County. Santa Barbara County is in attainment or unclassifiable for the NAAQS for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter 10 microns

or less diameter (PM_{10}), sulfur dioxide (SO_2), and ozone (O_3). The US EPA Region 9 has declared that the county is in attainment of the federal 1-hour ozone standard (USEPA Region 9 2003). U.S. EPA threshold limits used to determine general conformity are listed in Table D-8.

Emission quantification is defined as the sum of all direct and indirect criteria pollutants and precursor emissions, including stationary and mobile emission sources. Timing and location rather than the type of emission source distinguishes direct and indirect emissions. Direct emissions occur at the same time and place as the federal action. Indirect emissions include those that may occur later or at a distance from the federal action. General conformity limits the scope of indirect emissions to those that can be quantified and are reasonably foreseeable by the federal agency at the time of analysis, and those for which the federal agency can practicably control and will maintain control through its continuing program management responsibilities.

Table D-8. U.S. EPA threshold limits used to determine general conformity.

Criteria Pollutant Maintenance Status	Threshold Level (Tons/Year)
Ozone (NO, NO_2 or SO)	
All Maintenance Areas	100
Ozone [Volatile Organic Compound's (VOC's)]	
Maintenance areas inside an ozone transportation region	50
Maintenance areas outside an ozone transportation region	100
CO – All Maintenance Areas	100
PM_{10} - All Maintenance Areas	100
Pb - All Maintenance Areas	25

Source: 40 CFR 93.153(b), Protection of Environment, Determining Conformity Of Federal Actions To State Or Federal Implementation Plans, Applicability

Emissions Summary

As part of this conformity determination, the project emissions were compared with Santa Barbara County emissions. The latest, approved emission inventory is the 1999 Annual Emission Inventory, as found in the 2001 Clean Air Plan. Because Outer Continental Shelf sources are now part of Santa Barbara County Air Pollution Control District (SBCAPCD) jurisdiction and contribute to air quality impacts in Santa Barbara County, Outer Continental Shelf emission sources are included in the total emissions. Both inventories and the emission amounts that qualify as regional significant are presented in Table D-9. In Santa Barbara County, the term Reactive Organic Compounds (ROC) is used to describe that portion of Volatile Organic Compounds (VOC) that readily react in the atmosphere and produce ozone. The definition of ROC found in SBCAPCD Rule 102, *Definitions*, is identical to the U.S. EPA definition of VOC. They are used synonymously in this analysis.

Table D-9. 1999 Santa Barbara County (SBC) Annual Emission Inventory.

Source	Annual Emissions (Tons/Year)	
	NO_x	ROC
Santa Barbara County		
- Stationary Sources	2,001.46	3,051.82
- Area-Wide Sources	551.05	3,270.75
- Mobile Sources	15,316.54	9,351.65
Outer Continental Shelf		
- Stationary Sources	254.99	377.24
- Mobile Sources	10,356.26	651.23
Total SBC	*28,480.30*	*16,702.69*
Regional Significant Emissions	*2,848.03*	*1,670.27*

Source: 2001 Santa Barbara County APCD Clean Air Plan

Proposed Action Emissions and Conformity Determination

Due to the maintenance status of ozone for Santa Barbara County, the corresponding threshold of 100 tons per year for O_3 is used to determine general conformity. Because construction activities would occur prior to the operational activities, separate construction and operational emission calculations are presented for this determination.

Table D-10 shows a comparison of the estimated annual project emissions for construction with threshold and with regional significant emission levels. Table D-11 shows a comparison of estimated annual operational emissions with threshold and with regional significant emission levels.

Table D-10. Proposed Action construction emissions at Vandenberg AFB.

Source	Annual Construction Emissions (Tons/Year)		Exceeds Threshold or Regional Significant
	NO_x	ROC	
Project Construction Emissions[a]	3.08	0.29	No
De minimis Thresholds	100.00	100.00	
Regional Significant Emission Levels[b]	2,848.03	1,670.27	

Notes:
a These are project totals for 10 months, which are less than yearly totals. Values from Table D-4.
b Values from Table D-9.

Table D-11. Proposed Action operational emissions at Vandenberg AFB.

Source	Annual Operational Emissions (Tons/Year)		Exceeds Threshold or Regional Significant
	NO_x	ROC	
Project Operational Emissions[a]	0.30	0.03	No
De minimis Thresholds	100.00	100.00	
Regional Significant Emission Levels[b]	2,848.03	1,670.27	

Notes:
a Values from Table D-7.
b Values from Table D-9.

The total direct and indirect emissions for the construction and operation of the Western Range Command Transmit Site project do not exceed Federal *de minimis* conformity threshold values for O_3 precursors (NO_x and VOCs). In addition, total emissions of NO_x and VOCs from the Proposed Action are less than 10 percent of the latest approved Annual Emission Inventory for Santa Barbara County (2001 SBCAPCD Clean Air Plan). The Proposed Action is therefore deemed *de minimis* and not regionally significant and is exempt from further conformity requirements.